



EVALUATING ARTIFICIAL INTELLIGENCE TOOL CHATGPT VERSUS MULTIDISCIPLINARY TEAM DECISION-MAKING IN PROSTATE CANCER CARE: A COMPARATIVE ANALYSIS

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ABSTRACT

Chat Generative Pre- Trained Transformer (ChatGPT) and other Large Language Models (LLM's) are used as a patient education tool in Healthcare and urology, yet nothing has been published on their practical use within the cancer multi-disciplinary team (MDT) meeting. Here we test ChatGPT's treatment recommendations for patients with prostate cancer against those made in Real world multi-disciplinary team (MDT) meeting. 15 prostate cancer patient's details copied unedited from the MDT meeting containing their age, PSA, MRI Staging and prostate biopsy histopathology and artificial intelligence (AI) was directed to recommend the best treatment option for the specific patient according to the guideline linked and then compared directly to the real world MDT meeting outcome. Urologist reviewed the answer and decided if concordance has been met or not. All 15 patients that were recommended treatment option by the AI was concordant with the real world decision made by the MDT meeting. 2 localized ca prostate patients recommended radical prostatectomy (RP) out of which one patient underwent RP and another case RP deferred due to patient preference. 2 very low risk patient recommended active surveillance, 3 locally advanced ca prostate cases were recommended multimodality treatment with radiotherapy and long term androgen deprivation therapy (ADT). 6 cases of metastatic ca prostate were recommended chemotherapy in addition to ADT. 2 case of metastatic castrate resistant ca prostate were recommended docetaxel chemotherapy. ChatGPT has huge implications for streamlining and speeding up MDT meetings. We believed that Urologist must remain both vigilant and open to the capabilities of AI LLM's and to embrace this technology for the bettering of our Healthcare systems and patient care.

KEYWORDS : Artificial intelligence, ChatGPT, multi-disciplinary team meeting, Carcinoma prostate.

INTRODUCTION

Prostate cancer is a major health concern for men around the globe. Early detection, effective treatment, and ongoing patient support are crucial in managing this disease. In recent years, advancements in artificial intelligence (AI) have introduced new tools and methodologies to enhance these aspects of healthcare. One such innovation is Chat Generative Pre- Trained Transformer (ChatGPT), an AI language model developed by OpenAI. Generative Pre-Trained Transformer (ChatGPT) and other Large Language Models (LLM's) are used as a patient education tools in Healthcare and urology, yet nothing has been published on their practical use within the cancer multi-disciplinary team (MDT) meeting.

To compare ChatGPT's treatment recommendations for patients with prostate cancer against those made in Real world multi-disciplinary team (MDT) meeting

MATERIALS AND METHODS

The European Association of urology (EAU) prostate cancer guidelines 2024 were linked to ChatGPT 4.0. 15 prostate cancer patient's details copied unedited from the MDT meeting containing their age, PSA, MRI Staging and prostate biopsy histopathology. The artificial intelligence (AI) was directed to recommend the best treatment option for the specific patient according to the guideline linked and then compared directly to the real world MDT meeting outcome. Urologist reviewed the answer and decided if concordance has been met or not.

Objective

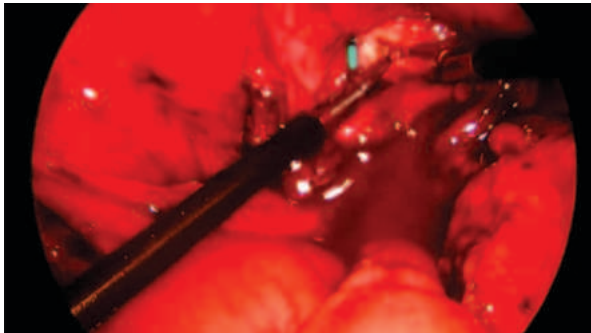
Two Sample profile (from real world ca prostate pt)	ChatGPT response (unedited)	ChatGPT treatment recommendation	Real world MDT meeting treatment recommendation	Concordance between ChatGPT and MDT meetings
Patient 1/15: Aged 60 years PSA rising to the level of 6.2 ng/ml. No other commodities. He has no urinary symptoms. His prostate felt benign moderately enlarged. MRI Staging is T2N0M0. Gleason score 6 (3+3). No cribriform pattern.	Based on the European Association of Urology (EAU) guidelines, the patient with the following characteristics: <ul style="list-style-type: none"> • Age: 60 years • PSA: 6.2 ng/ml • No urinary symptoms • MRI Staging: T2N0M0 • Gleason score: 6 (3+3) • No cribriform pattern falls into the low-risk category for prostate cancer. Treatment recommendations according to EAU guidelines for a patient in the low-risk category include: <ol style="list-style-type: none"> 1. Active Surveillance (AS): <ul style="list-style-type: none"> o This is the preferred option, especially given the patient's age, PSA level, and Gleason score. AS involves closely monitoring the patient with regular PSA testing, digital rectal examinations (DRE), and repeat biopsies or MRIs to detect any progression of the disease. 	AS RP EBRT/ BrT Focal therapy Psychological support, 'Risk adopted strategy'	AS	YES

	<p>2. Radical Prostatectomy: o While AS is preferred, radical prostatectomy can be considered, particularly if the patient prefers definitive treatment or if there are factors that may not be apparent in initial assessments that suggest a higher risk of progression.</p> <p>3. Radiotherapy: o External beam radiotherapy (EBRT) or brachytherapy may also be considered as an alternative to surgery, particularly if the patient opts against AS or surgery.</p> <p>4. Focal Therapy: o This is an emerging option for select patients and can be discussed as a part of a clinical trial or specialized centers.</p> <p>Follow-up and Monitoring: • If AS is chosen, close monitoring with regular intervals of PSA testing (every 3-6 months), DRE, and periodic repeat biopsies or MRIs is necessary to ensure the cancer is not progressing.</p> <p>Final Consideration: The patient's life expectancy, comorbidities (or lack thereof), and personal preferences, thorough discussion between the patient and his healthcare provider should guide the decision-making process. Active surveillance is typically the most recommended approach for a low-risk patient like this.</p> <p>lifestyle modifications and the supportive care: Lifetime modifications including a healthy diet, regular exercise, and stress management can be beneficial.</p> <p>Supportive care to address any psychological distress due to the diagnosis and referrals to mental health professionals should be considered as part of comprehensive care.</p>			
<p>Patient 2/15: what is the recommendation treatment option as per EAU guidelines for 65-years age ca prostate patient with serum PSA 16 ng/ml, prostate biopsy gleason score 3+4 = 7, grade group 2, MRI staging T2N0M0?</p>	<p>For a 65-year-old patient with the following prostate cancer characteristics: • Serum PSA: 16 ng/ml • Gleason Score: 3+4 = 7 (Grade Group 2) • MRI Staging: T2N0M0 (localized disease) • No cribriform pattern or other adverse features</p> <p>This patient falls into the intermediate-risk category according to the European Association of Urology (EAU) guidelines.</p> <p>EAU Treatment Recommendations for Intermediate-Risk Prostate Cancer: 1. Radical Prostatectomy (RP): o Primary Option: Radical prostatectomy is a recommended treatment option for patients with intermediate-risk prostate cancer. This involves the surgical removal of the prostate gland and may include pelvic lymph node dissection, particularly if there is a higher risk of nodal involvement. o Considerations: Discuss the potential side effects, such as urinary incontinence and erectile dysfunction. The decision on nerve-sparing surgery should be individualized based on the patient's cancer characteristics and desire to preserve erectile function.</p> <p>2. Radiotherapy (RT): o External Beam Radiotherapy (EBRT): Standard treatment option involving high-dose radiation targeted at the prostate. Given the intermediate-risk classification, combining EBRT with short-term androgen deprivation therapy (ADT) for 4-6 months is often recommended to improve treatment outcomes. o Brachytherapy (BT): As a monotherapy (LDR) or combined with EBRT (HDR), brachytherapy is another viable option for definitive treatment.</p>	<p>Radical Prostatectomy</p> <p>Radiotherapy with or without ADT</p>	<p>Radical Prostatectomy</p>	<p>YES</p>

	<p>o Consideration: In a healthy 65-year-old patient, EBRT combined with short-term ADT is a strong recommendation if surgery is not preferred.</p> <p>Follow-Up and Monitoring:</p> <ul style="list-style-type: none"> • Post-Treatment Monitoring: Regular PSA testing every 3-6 months during the first few years, then every 6-12 months thereafter. • Imaging: Further imaging may be necessary if there is suspicion of disease recurrence or if PSA levels rise post-treatment. <p>In summary, for a healthy 65-year-old patient with intermediate-risk prostate cancer and no comorbidities, the EAU guidelines primarily recommend radical prostatectomy or radiotherapy (with short-term ADT) as the most appropriate treatment option</p>			
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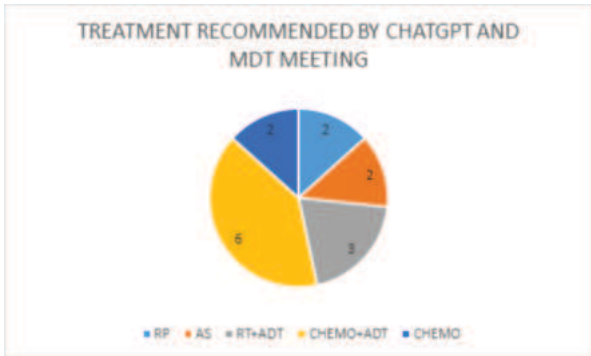
RESULTS

All 15 patients that were recommended treatment option by the AI based on the EAU guidelines was concordant with the real world decision made by the MDT meeting. 2 localized ca prostate patients recommended radical prostatectomy (RP) out of which one patient underwent RP and another case RP deferred due to patient preference.



Laparoscopic radical prostatectomy intra op picture - Anterior approach (*Prostate)

2 very low risk patient recommended active surveillance, 3 locally advanced ca prostate cases were recommended multimodality treatment with radiotherapy and long term androgen deprivation therapy (ADT), 6 cases of metastatic ca prostate were recommended chemotherapy in addition to ADT. 2 case of metastatic castrate resistant ca prostate were recommended docetaxel chemotherapy.



DISCUSSION

In clinical settings, ChatGPT can be an invaluable resource for healthcare professionals. It can provide real-time, evidence-based recommendations for diagnosing and treating prostate cancer. It is believed that this simple study has demonstrated a very practical application of this novel AI technology, that is on the cusp of eliciting a real Paradigm shift in the way our health care system work.

Additionally, ChatGPT can assist in interpreting diagnostic tests and imaging results. By analysing data from various diagnostic tools such as MRI, PSA levels, and biopsy reports,

the AI can help clinicians make more accurate and timely diagnoses. This capability is particularly beneficial in distinguishing between aggressive and indolent forms of prostate cancer, which is critical for determining the appropriate treatment approach.

We have demonstrated that it can be given real patient profile, directly from a real world cancer MDT meeting and accurately summarise the best treatment options for individual patients based on the latest recommendations.

An important limitation of ChatGPT is related to ethical issues which needs to be explored especially when it comes to the novel application of such AI technologies within Healthcare system. Other limitation of our study naturally include small sample size but we believe that the more the targeted use of ChatGPT the greatest value may be obtained. Further studies are needed to better define the role of ChatGPT in urological clinical and academic practices and to overcome unmet needs if any. However, while ChatGPT won't replace urologist, those who integrate ChatGPT into their practice are likely to surpass those who don't.

CONCLUSION

ChatGPT represents a transformative tool in the fight against prostate cancer. Its applications in medical research, clinical practice, and patient support highlight the potential of AI to improve outcomes and quality of life for patients. By leveraging the capabilities of ChatGPT, the medical community can make significant strides in understanding, diagnosing, and treating prostate cancer, ultimately leading to better patient care and advancements in the field.

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