Title

Predictive AI for Palliative Care Needs in Advanced Cancer Patients

Key Points

・Determining the need for palliative care has been a challenging task, even for healthcare professionals specializing in oncology.

・The predictive AI developed by the research team not only enables precise evaluation of palliative care needs in patients with advanced cancer, but also performs better than existing methods of distress screening.

・This innovation facilitates the quick screening of all cancer patients, potentially promoting the provision of specialist palliative care.

Summary

The research group comprises Arisa Kawashima, a PhD student at the Nagoya University Graduate School of Medicine; Kazuki Sato, Professor at the Nagoya University Graduate School of Medicine; Taiki Furukawa, Vice Director at the Medical IT Center; Takahiro Imaizumi, Designated Assistant Professor at the Department of Advanced Medicine; Akemi Morohashi, Researcher at the Department of Advanced Medicine; Mariko Hara, an Oncology Certified Nurse Specialist; Satomi Yamada and Masayo Hama, Certified Nurses in Cancer Chemotherapy Nursing; and Aya Kawaguchi, an Outpatient Nurse Manager at Nagoya University Hospital.

Palliative care aims to alleviate the symptoms and suffering of patients with serious illnesses and improve their quality of life. However, traditional methods for distress screening to identify cancer patients in need of palliative care are time-consuming and have not been widely adopted.

The research team has successfully developed an AI algorithm that accurately determines the need for specialist palliative care in patients with advanced cancer, relying solely on medical information from electronic medical records. This breakthrough addresses the challenge of determining palliative care needs, a task that has been difficult even for healthcare professionals specializing in oncology. The AI developed by the team not only enables precise evaluation of palliative care needs in patients with advanced cancer but also performs better than existing methods of distress screening. This innovation facilitates the quick screening of all cancer patients, potentially promoting the provision of specialist palliative care.

In anticipation of future developments, the team is planning the next phase of research for clinical application. The results of this study have been published in the *'Journal of Pain and Symptom Management'* (Published: January 10, 2024).

Research Background

Palliative care aims to alleviate the symptoms and suffering of patients with serious illnesses and improve their quality of life. With the global population aging, it is estimated that 48 million individuals will die with serious health-related suffering and require palliative care by 2060. Previous research indicates that initiating early palliative care with cancer treatment right after an advanced cancer diagnosis may extend patients' life expectancy.

Traditional methods for distress screening, used to identify cancer patients in need of palliative care, are time-consuming and typically take about 60 minutes per patient. Staffing and time constraints have prevented these methods from being widely implemented, resulting in many patients who would benefit from palliative care not receiving it.

There has been a growing demand for a system that can automatically determine palliative care needs using data from electronic health records collected during routine exams.

Research Results

The research team analyzed data from 561 advanced cancer patients who underwent chemotherapy and distress screening at Nagoya University Hospital. The AI was trained using a broad spectrum of patient medical data, such as laboratory tests and nursing records from electronic medical records, as well as assessments of palliative care needs made by palliative and oncology nursing specialists (Fig 1). It demonstrated a high sensitivity of 95.8% in identifying patients who need palliative care, outperforming the traditional distress screening which have a sensitivity of 80.7%.

If integrated into electronic medical records, this AI could facilitate the quick screening of all cancer patients. Such early identification of palliative care needs might enable timely discussions about care options with patients and potentially foster collaboration with palliative care teams.
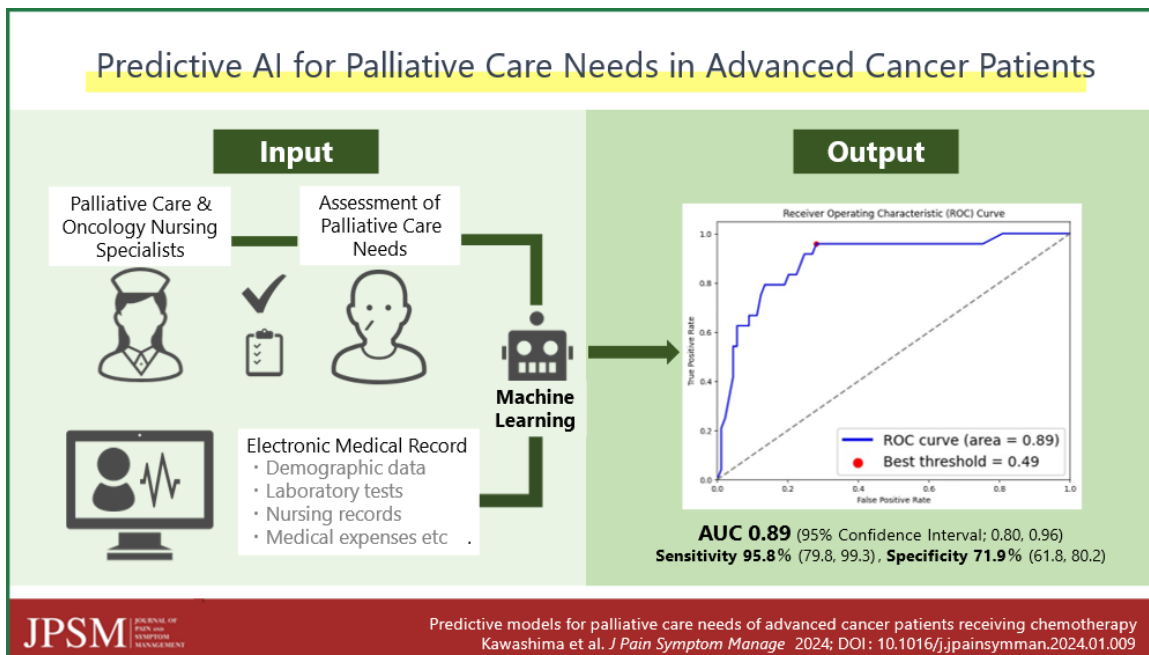
Fig 1. Graphical abstract

Research Summary and Future Perspective

The research team has successfully developed an AI algorithm that accurately determines the need for specialist palliative care in patients with advanced cancer. Following these findings, they are planning the next stage of research to implement AI across multiple medical centers. The goal is to establish a system capable of assessing the need for palliative care in any hospital throughout Japan.

Publication

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