

Cancer and Artificial Intelligence

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Dear Editor,

Cancer is a current problem that affects human life and quality of life worldwide. According to the 2019 data of the WHO (World Health Organization), it is among the first or second causes of death in individuals before the age of 70 in 112 out of 183 countries (1). In addition, according to GLOBOCAN (Global Cancer Observatory) data, 20 million new cancer cases were seen in 2022 (2). High mortality rates and high interaction power with the microenvironment of cancer reveal the importance of early diagnosis, effective treatment and monitoring of the disease.

The concept of Artificial Intelligence, which emerged in the middle of the 19th century, was based on the construction of machines that could analyze and reason complex data, and think and make inferences on complex situations like humans. Thanks to the groundbreaking ideas of scientists, artificial intelligence, which has become a reality by being included in research laboratories, has made many developments (3). Thanks to the rapidly developing technology in the last half century, its usage area has expanded considerably today and Artificial Intelligence, which is advancing more and more every new day, has become a tool used in many scientific fields by including different subgroups. Artificial Intelligence tools, which can be used for many purposes such as creating data banks, storing data, organizing information obtained from different sources and creating outputs, making predictions, etc., are also of great interest in clinical cancer research.

Cancer is a multifactorial group of diseases that are known to affect human life with incidence and mortality rates.

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This complex group of diseases includes treatment options such as surgery, chemotherapy, radiotherapy, individual treatment, etc., and/or if several of these are applied together (4).

Prolonging the survival time of patients, determining the effective treatment method, reducing recurrence and monitoring post-treatment conditions are among the main goals of clinicians. In addition to these, the susceptibility of individuals to the disease in cancer types, the accuracy of the diagnosis, the determination of the prognosis, the late appearance of symptoms in some cancer types, etc. are among the difficulties of this disease.

The treatment of cancer is improving itself every day, thanks to the constant increase in current information and developments in other fields of science. The development of new techniques is effective in determining and applying treatments for the patient. Artificial Intelligence and developments in its sub-branches are used in confirming the diagnosis, applying optimal treatment, combined drug therapy applications, predicting possible recurrence, and estimating survival times, and they produce scientifically satisfactory results (5, 6).

Artificial Intelligence and the development of new strategies in cancer treatment are of great importance in helping physicians apply optimized treatment tailored to the patient, overcoming both physical and psychological difficulties, and preventing the recurrence and spread of the disease. In addition, it is groundbreaking in shortening the treatment process, overcoming extra drug burden, accurate diagnosis and applicability of effective treatment method in a shorter time. Thanks to the field of health and Artificial Intelligence, which are integrated with current developments in coordination with each other, great advances have been made and continue to be made in the diagnosis, treatment and prognosis of cancer, one of the major problems of our age.

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2021;71: 209-249.
2. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2024;74(3):229-263.
3. Huang S, Yang J, Fong S, Zhao Q. Artificial intelligence in cancer diagnosis and prognosis: Opportunities and challenges. *Cancer Lett.* 2020; 471:61-71.
4. Hu, C., Liu, X., Zeng, Y. et al. DNA methyltransferase inhibitors combination therapy for the treatment of solid tumor: mechanism and clinical application. *Clin Epigenet*, 2021; 13, 166.
5. Wong D, Yip S. Machine learning classifies cancer. *Nature.* 2018; 555(7697):446-447.
6. Kourou K, Exarchos TP, Exarchos KP, Karamouzis MV, Fotiadis DI. Machine learning applications in cancer prognosis and prediction. *Comput Struct Biotechnol J.* 2014;13:8-17.