Thyroid Cancer Diagnosis and Treatment Challenges - The Place for AI Improvement

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Abstract Thyroid cancer is one of the most rapid growing forms of endocrine neoplasia. Genetic predispositions augmented by environmental factors such as high radiation exposure, Hashimoto's thyroiditis, endocrine disruptors and improvement in detection technology contribute to the growing rates in diagnosis of these cancer types. Thyroid imaging studies, fine needle aspiration biopsies and histological biomarkers availability for assessing cancer cell proliferation have lately emerged as useful tools in guiding diagnosis and treatment.

However, diagnosis work-up and personalized effective course of treatment for each patient and cancer subtype are time and resource consuming. The utilization of computer-aided diagnosis systems as radionics used in conjunction with ultrasonography imaging for analyzing thyroid images has seen a significant increase in use recently. These systems, have enhanced diagnostic accuracy and reduced operator-dependent eye-based image recognition of ultrasonography imaging, becoming cost-effective and practical diagnostic method in clinical practice.

Classifying tumors based on images and bimolecular data sets can train machine learning for improvement of the accuracy of thyroid carcinoma classification. Machine learning (ML) and deep learning (DL) may improve automating the classification of thyroid nodules in applications such as US, fine-needle aspiration (FNA) aiding in early detection and more effective treatment planning. (1).

AI can analyze complex medical data at a scale and precision beyond human capacity, improving early disease detection, accurate diagnoses, and personalized treatment planning in patients inflicted by thyroid cancer (2).

Keywords: Thyroid Cancer, Machine Learning, Artificial Inteligence

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