Editorial

Innovations in Cancer Diagnosis and Challenges

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A R T I C L E   I N F O

Cancer is a disease that is characterized by the abnormal and uncontrolled growth of cells which can develop in any part of the body. For the diagnosis of cancer, the tissue sample, fluid or blood is submitted to the laboratory, where a team work of expert laboratory persons concludes a diagnose. In the past the role of pathologist and their team was limited up to diagnosing type and grade of cancer which was primarily based on light microscopic findings of hematoxylin and eosin stained slide. The challenges of diagnosing cancer increased with evolving complex classifications of cancer. The role of pathologist then expanded to incorporate a number of prognostic and predictive findings in the pathology report. To acquire these prognostic and predictive findings pathologist had to take more tissue sections and needed more special tests which expanded the work load of laboratory staff, yet it helped the oncologist to treat the patients. For pathologist, free accessible resource checklists are easily available for these prognostic and predictive factors at different websites.

Innovation of immunohistochemistry (IHC) was another milestone which has been a useful tool to solve difficult cases, in addition it also has prognostic and predictive role. Incorporation of molecular and cytogenetic techniques to cancer have evolved the personalized medicine which significantly improved the management of cancer patients. To achieve this goal collaborative efforts are required with oncologist who can inform the pathologists about the required molecular or cytogenetic tests. Artificial intelligence and machine learning for cancer diagnosis is challenging but thriving and still in phase of seeking accreditations.

The cardinal step in cancer diagnosis and optimal treatment is to integrate resource checklist, IHC, molecular and cytogenetic studies in the report, some of these studies are expensive but rewarding for the patient.

The biggest challenge to achieve these goals is resource availability, its high cost and instrument maintenance. To attain standardization of above mentioned tests and quality reports, the laboratories can develop standard operating procedures and follow them strictly. For other challenges and inter-observer variability of pathologist, enrolling into a Proficiency testing programs or Alternative assessment are reliable tools which also increase reliability and accuracy of results and testing processes. Medial audits followed by corrective actions, continuous medical education of laboratory staff and pathologist is also crucial. Last but not least the high-volume of work with inadequate number of experienced laboratory staff can significantly affect the results.