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Cancer Science 2018: The major Oncology Diagnostics tools and the role of oncologist to control the different types of cancer in the world - Mr. Muhammad usman - Former Director General of Agricultural Research System, Pakistan.

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The aims of presentation consist of oncology, diagnostic, different types of cancer and oncologist were studied and reported that the major oncology diagnostic tools as well as the role oncologist to control the different types of cancer in the world. Cancer is a group of more than 100 different diseases. It can develop almost anywhere in the body. The term oncology literally means a branch of science that deals with tumors and cancers. The word consist of "onco" means bulk, mass, or tumor while "-logy" means study. In a simple words, oncology is the study of cancer and its treatments in medical science. The most important oncology diagnostic remains the clinical history of the patient. Common symptoms that point towards cancer include fatigue, weight loss, unexplained anemia, fever of unknown origin etc. Oncology depends on diagnostic tools like biopsy or removal of bits of the tumors tissue and examining it under the microscope. Other diagnostic tools include endoscopy for the gastrointestinal tract, imaging studies like X-rays, CT scanning, MRI scanning, ultrasound and other radiological techniques, Scintigraphy, Single Photon Emission Computed Tomography, Positron emission tomography and nuclear medicine techniques etc. The oncologist's role including. Explaining the cancer diagnosis and stage to the patient. Discussing all relevant treatment options and the oncologist's recommendations. Delivering high-quality, compassionate care. Helping the patient manage cancer-related pain and other symptoms or treatment side effects. In the light of the above study, it is proposed to commercialized the major oncology diagnostic tools as well as the role of oncologist to control the different types of cancer in the world.

Molecular diagnostics is a part of laboratory medicine, which relies on the detection of individual biologic molecules. The potential of molecular genetic tools was initially recognized by oncohematologists, given that specific chromosomal translocations may significantly aid the diagnosis of various leukemia and lymphomas. The emergence of practical applications of molecular oncology is largely attributed to the development of user-friendly methods of molecular analysis. The invention of PCR (polymerase chain reaction) led to an enormous breakthrough in clinical DNA testing: PCR-based techniques require relatively simple instrumentation and infra-structure, utilize only minute amounts of biological material and are highly compatible with clinical routine. The development of immunohistochemistry (IHC), i.e., the method allowing the visualization of specific antigen within the tissue, dates back to the mid XX century. IHC was adapted for the clinical determination of the level of expression of estrogen receptor (ER) more than thirty years ago; this was a truly historical advance in personalized oncology, as it changed medical attitudes toward the most common oncological disease, i.e. breast cancer (BC), by tailoring endocrine therapy to a laboratory test. For the time being, some conventional protein-targeted tests, e.g., IHC or determination of tumor-specific serum markers (PSA, CA-125, etc.), are rarely discussed in the framework of molecular diagnostics. The latter term is usually applied to DNA- or RNA-based assays as well as to some modern sophisticated proteomic technologies.

The number of cancer patients in Europe is rising and significant advances in basic and applied cancer research are making the provision of optimal care more challenging. The concept of cancer as a systemic, highly heterogeneous and complex disease has increased the awareness that quality cancer care should be provided by a multidisciplinary team (MDT) of highly qualified healthcare professionals. Cancer patients also have the right to benefit from medical progress by receiving optimal treatment from adequately trained and highly skilled medical professionals. This position paper summarizes the multifarious and vital contributions of medical oncology and medical oncologists to today's and tomorrow's professional cancer care.

Medical oncology is a core member of the MDT and offers cancer patients a comprehensive and systemic

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approach to treatment and care, spanning the entire disease spectrum, including research, prevention, diagnosis, treatment, rehabilitation and supportive and palliative care, thereby complementing the skill sets of cancer specialists from other disciplines. Medical oncologists are trained in the comprehensive management of cancer patients, the safe delivery of systemic cancer treatments and the management of treatment side-effects and disease symptoms. As part of their training and clinical practice, medical oncologists frequently engage in clinical and translational research to promote innovation and new therapies.

Epidermal growth factor receptor (EGFR) inhibitors entered clinical trials in the beginning of the last decade. It was assumed that virtually all types of epithelial malignancies are characterized by some involvement of EGFR activation; therefore EGFR-directed therapies were expected to be efficient in a wide spectrum of cancers. First trials on a small-molecule EGFR tyrosine kinase inhibitor (TKI), gefitinib, involved heavily pretreated patients with the lack of available standard treatment options. Impressively, 4 out of 16 lung cancer (LC) patients included in the phase I study demonstrated the response to the drug. These observations were confirmed in subsequent phase II studies, where some proportion of LC patients experienced dramatic tumor reduction upon gefitinib therapy. It remained unknown, why this drug rendered clear and immediate benefit to some small subset of LC patients while being overtly ineffective in the majority of LC cases. In the year 2004, three research groups independently reported the results of EGFR gene sequencing in tumors obtained from EGFR TKI responders and non-responders. It turned out that cancer from virtually all responders carried by then unknown intragenic mutation in EGFR gene, while non-responders were characterized by the wild-type EGFR sequence. This discovery opened an era of mutation-specific drugs, and EGFR mutation testing is now a standard diagnostic procedure in LC management.

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