Presidential Oration

NEW TECHNOLOGY, NEW PERSPECTIVES AND NEW APPROACHES FOR DIAGNOSIS OF PARASITIC DISEASES IN 21ST CENTURY

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The diagnosis of parasitic diseases has undergone major changes because of increased awareness, changing perspectives and technological advances that pave way for more rapid and accurate diagnosis of parasitic diseases. These advances are of utmost importance for the continuing diagnosis of parasitic infections in view of the steady decline in the quantity and quality of technicians who are expert in the conventional techniques of examination of stool and blood smears for parasites

Uses of hybridoma-derived monoclonal antibodies or synthetic peptide antigens for immunodiagnosis are examples of new approaches for diagnosis of parasitic diseases. Certain disease specific approaches are detection of cell-free parasite DNA in plasma for diagnosis of schistosomiasis and use of a novel, rapid, high-throughput quantitative multi-parallel real time polymerase chain reaction (qPCR) for detection of eight gastrointestinal parasites is note worthy.

Some of the latest technologies which have been utilised for diagnosis of parasitic diseases include – a) microarrays which have the unprecedented potential to simultaneously detect and identify thousands of microbial genes, b)LUMINEX xMAP technology capable of detection of up to 100 DNA targets in one single assay, c) mini FLOTAC technique, an innovative direct diagnostic technique, for intestinal parasitic infections, d) mass spectrometry technology that identifies common biomarkers in Chagas disease and e) a pioneering mobile device using cutting-edge nanotechnology to rapidly detect malaria infection and drug resistance.

Availability of annotated, genome sequences for parasites of public health importance and their vectors has led to the emergence of a new research paradigm for development of diagnostic tests. The changing perspectives in diagnosis of parasitic diseases can be exemplified by development of remote screening methods such as web based virtual microscopy for diagnosis of malaria and other parasitic infections involving tissues, stools, and blood.

In this presentation, the new perspectives and approaches for diagnosis of parasitic diseases will be discussed highlighting the latest technological advances that may aid in rapid and accurate diagnosis of various parasitic diseases.