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Editorial

Near Patient testing: A step towards "Laboratory on a chip"

With a revolutionary introduction of nucleic acid analysis, bioinformatics, nanotechnology and microelectronics in identification and characterization of pathogen, the scenario of detecting the presence of pathogen and its antimicrobial resistance within an hour is no longer a fiction but is a reality now. These developments, particularly with regard to near patient testing, have important implications for the delivery of health care. This newer concept may affect primary care, prescribing practice, organization of laboratories, counseling services, surveillance, epidemiology and medicolegal practice[1].

Near patient testing (NPT) is defined as any investigation carried out in a clinical setting or the patient's home for which the result is available without reference to a laboratory and rapid enough to affect immediate patient management The main driving forces behind the development of such testing kits have been the search for life in space exploration and the military's need to detect agents of biological warfare where miniaturization and robustness of detection systems was required. But now NPT could be implemented in various settings—at hospital bedside, in an outpatient clinic, in a dental or general practice surgery, or in a patient's home. Testing kits might be complete diagnostic units, new detection systems for antigen-antibody complexes, allowing results to be read by visual inspection, use of a control that is built into the kit, needing no processing other than application of test material and yielding instant results, or they may need manipulation of test material or use of other equipment for the test to be read and interpreted. Such kits include those for detecting the flu virus, respiratory syncytial virus, and group A streptococci, *Clostridium difficile* toxin A in faeces, *H pylori* infection, malaria, filariasis, kalaazar, leptospirosis, ligeonellosis, UTI, enteric fever and many others[2]. Predicted development area of NPT are the microminiaturization which will revolutionize integration of diagnostic procedures in order to produce a "laboratory on a chip", use of RNA fragment as possible alternative to monoclonal antibodies, etc.

NPT will undoubtedly change clinical practice. A major advantage is the potential for rapid accurate diagnosis targeted use of antimicrobial drugs, improve patient compliance and improve the quality of service offered by clinicians who are remote from major diagnostic facilities. This will be useful to emergency, prison, immigration services, where rapid determination of HIV infection, hepatitis, tuberculosis, or methicillin resistant *Staphylococcus aureus* (MRSA) detection may be beneficial[3]. General practitioners, outpatient clinics involved in controlling communicable disease in the community would also benefit from rapid diagnostic kits for diseases such as diphtheria, tuberculosis, or salmonella infection and for acute infections such as meningococcal meningitis or septicaemia.

Potential problems of near patient testing include inappropriate sample collection, misinterpretation of positive results and self administration of remedies[4]. These concerns indicate that quality control and assurance, and possibly accreditation, need to be considered and raise questions about whether testing kits should be available as over the counter diagnostics. As kits will become more accessible and easier to use, their potential for misuse will increase, especially in the absence of expert explanation or counseling and safe disposal of used kits will be an additional responsibility. There will be also chance of potential loss of epidemiological data, less opportunity for large scale automation and increased burden on microbiology laboratories (from demands for confirmatory tests).With all these possibilities. we should be optimistic that this technological development will bring great improvements in public health through advances in detecting and controlling infections.

References

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Professor Dr. Ahmed Abu Saleh
Department of Microbiology and Immunology
Bangabandhu Sheikh Mujib Medical University
Shahbag, Dhaka.
E mail : aasaleh@gmail.com