

WHO Collaborating Centre for Acquired Immunodeficiency Syndrome for the Eastern Mediterranean Regional Office, Faculty of Medicine, Kuwait University, Kuwait

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Key Words

WHO collaboration centre · HIV workshop · Annual symposia

Abstract

In the early 1980s, the World Health Organization (WHO) designated the Virology Unit of the Faculty of Medicine, Health Sciences Centre, Kuwait University, Kuwait, a collaborating centre for AIDS for the Eastern Mediterranean Regional Office (EMRO), recognizing it to be in compliance with WHO guidelines. In this centre, research integral to the efforts of WHO to combat AIDS is conducted. In addition to annual workshops and symposia, the centre is constantly updating and renewing its facilities and capabilities in keeping with current and latest advances in virology. As an example of the activities of the centre, the HIV-1 RNA viral load in plasma samples of HIV-1 patients is determined by real-time PCR using the AmpliPrep TaqMan HIV-1 test v2.0. HIV-1 drug resistance is determined by sequencing the reverse transcriptase and protease regions on the HIV-1 *pol* gene, using the TRUGENE HIV-1 Genotyping Assay on the OpenGene® DNA Sequencing System. HIV-1 subtypes are determined by sequencing the reverse transcriptase and protease regions on the HIV-1 *pol* gene using the genotyping assays

described above. A fundamental program of Kuwait's WHO AIDS collaboration centre is the national project on the surveillance of drug resistance in human deficiency virus in Kuwait, which illustrates how the centre and its activities in Kuwait can serve the EMRO region of WHO.

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Introduction

The World Health Organization's (WHO) collaborating centre by definition is 'an institution designated by the director-general to form part of an international collaborative network carrying out activities in support of the organization's programme at all levels' [1]. These centres represent WHO's vision and mission in implementing its mandated work [1].

- Vision: WHO collaborating centres are key institutions with relevant expertise distributed throughout the world. They represent a valuable resource as an extended and integral arm of WHO's capacity to implement its mandated work.
- Mission: WHO collaborating centres are a highly valued mechanism of cooperation in which selected institutions are recognized by WHO to assist the organiza-

tion with implementing its mandated work. This is accomplished by supporting the achievement of planned strategic objectives at regional and global levels, enhancing the scientific validity of its global health work and developing and strengthening institutional capacity in countries and regions.

The concept of a collaborating centre is to provide a service, be it certain investigations or training in a specific field. The collaborative centres should have ample expertise available for consultation and/or training. These centres strategically serve WHO, both locally and regionally. The centre at the Faculty of Medicine, Health Sciences Centre, Kuwait University, is one of the WHO collaborative centres fulfilling this role.

Description of the Centre

In the early 1980s, the Faculty of Medicine's centre was designated a WHO collaboration centre [2] as it fulfilled all the required criteria of WHO [1–3], including the following:

- High scientific and technical standing at national and international levels
- Prominent place in the country's health, scientific or educational structures
- High quality of scientific and technical leadership and sufficient number of staff with high-level qualifications
- Stability in terms of personnel, activity and funding
- Strong working relationship with other institutions in the country and at inter-country, regional and global levels
- Clear ability, capacity and readiness to contribute, both individually and within networks, to WHO programme activities, whether in support of country programmes or through participation in international co-operative activities
- Clear technical and geographical relevance of both the institution and its activities to WHO's programme priorities
- At least 2 years of previous collaboration with WHO in carrying out jointly planned activities

Kuwait's centre is re-designated a WHO collaboration centre every 4 years following evaluation and approval by the relevant WHO responsible officer and technical staff [1–3]. The current director is Professor Widad Al-Nakib. The centre has approximately 34 staff members, including 3 consultants, 3 PhD specialist staff members, an average of 6–8 medical residents at any one time, a labora-

tory manager, and approximately 20 technicians. It also has access to many established specialists, including immunologists and molecular biologists.

The centre's main activities include providing consultation in virology and acting as a reference centre for HIV and other virological investigations for the Eastern Mediterranean Regional Office (EMRO), holding annual symposia on recent advances in clinical virology and annual training workshops on HIV. In addition, the centre has devised a service to detect HIV drug resistance and provide HIV genotyping [1–3]. These activities, included in the terms of reference as agreed upon with WHO in the current 4-year designation plan [2], are as follows:

- Hold annual symposia on recent advances in clinical virology in collaboration with EMRO every year from 2009 to 2012; all the symposia will cover aspects of recent advances in the study of HIV/AIDS
- Hold annual training workshops on the application of molecular techniques in the diagnosis and management of HIV/AIDS in the Eastern Mediterranean Region in collaboration with EMRO every year from 2009 to 2012
- Conduct virological consultations for the Eastern Mediterranean region
- Perform reference work for HIV drug resistance, sequencing, confirmation and genotyping

In 2012, over 153,564 virological investigations were conducted by the centre. The range of investigations is wide and includes investigations of FluA, CMV, HSV, EBV, adenovirus, parvovirus, polyoma virus, varicella-zoster virus, HHV-6, HCV, enteroviruses, respiratory viruses, HIV, and HBV using sophisticated molecular methods. The throughput of samples and patients through the centre in general virology has reached some 25,000 patient referrals per annum from local hospitals and medical centres.

HIV Work

In compliance with its terms of reference with WHO, the centre is continuously renewing and updating its equipment and techniques to meet the highest international specifications. A national project funded by Kuwait University for surveillance of drug resistance in HIV infection in Kuwait was awarded a grant of KWD 125,000 on April 1, 2011. Sophisticated equipment was purchased under this grant, for example, the TRUGENE sequencer [4], for genotyping HIV and identifying drug resistance to antiretroviral drugs.

In 2010, the centre acquired two sophisticated devices, the AmpliPrep TaqMan [5] (advanced technology in the field of HIV viral load estimation) and the ABI sequencer [6] (very advanced technology for viral genome sequencing).

In the centre, HIV-1 RNA viral load in plasma samples of HIV-1 patients is determined by real-time PCR using the AmpliPrep TaqMan HIV-1 test v2.0 (Roche Diagnostic Systems, Branchburg, N.J., USA). The test can detect HIV-1 RNA over the range of 20–10,000,000 copies/ml. One copy of HIV-1 RNA is equivalent to 1.7 ± 0.1 IU, based on the WHO first international standard for HIV-1 RNA for nucleic acid-based techniques. The results are expressed as copies/ml.

HIV-1 drug resistance is determined by sequencing the reverse transcriptase and protease regions on the HIV-1 *pol* gene, using the TRUGENE HIV-1 Genotyping Assay on the OpenGene[®] DNA Sequencing System (Siemens Healthcare Diagnostics, Deerfield, Ill., USA). This is the only test cleared by the FDA for use with viral loads of 1,000 copies/ml. When equivocal results are obtained with the TRUGENE assay, ViroSeq[™] HIV-1 Genotyping System (Abbott Laboratories, Abbott Park, Ill., USA) on the ABI Prism[®] 3130x Genetic Analyzer (Applied Biosystems, Foster City, Calif., USA) is used. This assay is FDA approved and can detect HIV-1 viral resistance in plasma samples with a viral load ranging from 2,000 to 750,000 copies/ml. Phylogenetic analysis is performed to detect cross-contamination between samples.

HIV-1 subtypes are determined by sequencing the reverse transcriptase and protease regions on the HIV-1 *pol* gene using the genotyping assays described above. The obtained sequences are then analysed and compared to sequences available from the GenBank database.

The Relationship between HIV Investigations and Dentistry

Dentists play a significant role in predicting the response to treatment with highly active antiretroviral therapy (HAART) and the emergence of resistance. In addition, oral manifestations can indicate as well as predict the progression of symptoms in patients with HIV/AIDS [1, 7–9]. At least one oral lesion is manifested in HIV/AIDS patients [7–10]. These manifestations include hairy leukoplakia, oral candidiasis, Kaposi sarcoma, human papilloma virus and necrotizing ulcerative gingivitis [7–10]. The use of HAART can alter the prevalence of such manifestations [7, 9, 10]. In addition, there is an increased

risk of developing dental caries in HIV patients who are not receiving HAART [9]. This demonstrates the important role of dentists in identifying new HIV/AIDS cases.

Annual Symposia

The centre has been holding annual symposia on recent advances in clinical virology for Kuwait and the EMRO region. International guest speakers and local faculty members present the most up-to-date information on recent advances in clinical virology (table 1).

HIV Workshops

In accordance with the requirements and guidelines of the centre's designation as a WHO collaboration centre, it has held annual training workshops on the application of molecular techniques in the diagnosis and management of HIV/AIDS for the EMRO region in collaboration with WHO EMRO every year since 2009. The expected outcome of these workshops is the training of local and other participants from the EMRO region nominated by WHO in the field of HIV/AIDS [1–3]. The centre's role and relationship to the WHO program is to develop national and international capacities in the field of molecular virology related to HIV/AIDS. Therefore, several workshops were held between 2005 and 2012 with regard to HIV (table 1).

Summary

The above describes recent activities of the WHO collaborating centre for AIDS for the EMRO region. As can be seen, the activities are varied and considerable, and the centre continues its activities based on a 4-year plan provided and approved by WHO [1, 3]. For the centre to carry out these activities, it clearly has to have a strong staff with different areas of experiences, especially in the field of molecular virology and molecular biology. The introduction of powerful molecular techniques for HIV drug resistance detection, genotyping and viral load measurements was essential if the centre were to carry out its required obligations as a WHO collaborating centre for AIDS in the EMRO region. Despite these capabilities, of which WHO are aware, little has come in terms of requests for HIV investigations from WHO or the WHO EMRO or any country in the region. It is hoped that our

Table 1. Dates and keynote speakers of 2005–2012 symposia and workshops

Date	Title and subject	Keynote speaker
May 7–9, 2005	– Application of molecular techniques in the detection of HIV	– Workshop
May 28–30, 2007	– Diagnosis and management of patients with HIV/AIDS	– Workshop
May 5–7, 2009	– Symposia – recent advances in clinical virology	– Prof. Paul M. Southern, Professor of Infectious Diseases, University of Texas, Southern Medical Center, Dallas, Tex., USA
May 4–6, 2010	– Symposia – recent advances in clinical virology	– Prof. Paul Klapper, Consultant Clinical Virologist, Manchester Royal Infirmary and Honorary Professor of Clinical Virology, University of Manchester, UK
April 3–5, 2011	– Detection and management of patients with drug resistance to antiretroviral drugs	– Workshop
April 5–7, 2011	– Symposia – recent advances in clinical virology	– Dr. Timothy Wreghitt, OBE, Vice President of the Royal College of Pathologists, Public Health Laboratory, Addenbrooke's Hospital, University of Cambridge, UK – Prof. Paul Klapper, Consultant Clinical Virologist, Manchester Royal Infirmary and Honorary Professor of Clinical Virology, University of Manchester, UK
April 22–24, 2012	– Genotyping and sequencing of HIV	– Workshop
April 24–26, 2012	– Symposia – recent advances in clinical virology	– Prof. Judith Breuer, MD, FRCPath, Department of Virology, University College London, UK – Prof. Karl Nicholson, MD, FRCPath, Infectious Disease Unit, Leicester Royal Infirmary, UK – Dr. Jean Ruelle, UCL-Bruxelles, AIDS Reference Laboratory, Belgium
April 23–25, 2013	– Symposia – recent advances in clinical virology	– Prof. Maria Zambon, BSc, BM, BCH, PhD, FRCPath, FMedSci, Director, Reference Microbiology Services, Microbiology Services Division, Colindale Health Protection Agency, London, UK – Dr. Hongyi Zhang, MBBS, MM, PhD, FRCPath, Consultant Medical Virologist and Deputy Clinical Services Director, Public Health Laboratory, Cambridge I Health Protection Agency, UK

national project on HIV drug resistance will be extended to cover other countries in the region. This will stimulate collaboration between countries and will provide a better picture of the pattern of HIV drug resistance and prevalence of HIV genotypes circulating in this region. In contrast to investigations, the annual symposia and workshops were attended by staff from countries of the Gulf region, Sudan and Syria, in addition to staff from Kuwait. We feel that by designating the centre as a WHO collaborating centre for AIDS, it forced the centre to reach a high standard of work and practice that was in the interest of the centre itself and Kuwait. Indeed, the centre now serves

Kuwait as a reference centre for HIV and the director of the centre is a member of the National AIDS Committee and chairman of the National AIDS Subcommittee. Through these committees, work is coordinated to serve public health and issues relating to HIV/AIDS in the state of Kuwait [11] are addressed.

Disclosure Statement

The authors declare that no conflict of interest exists in relation to the content of the article.

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