Comparative evaluation of RT-LAMP and RT-PCR for Detection of HIV-1 in the Sudan

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Background and purpose: Rapid, simple, cost effective, nucleic acid based test for detecting HIV-1 in areas with limited resources is badly needed. Loop-mediated isothermal amplification (LAMP) is a technique that allows the amplification of nucleic acids DNA and RNA with high specificity, sensitivity and rapidity under isothermal conditions. This study was conducted to evaluate RT-LAMP method for HIV-1 detection in comparison with RT-PCR.

Methodology: In the present study, ninety EDTA blood samples were studied; seventy samples were collected from HIV-1 infected patients and 20 samples from HIV-1 negative participants. All samples subjected to RT-LAMP and RT-PCR assay targeting HIV-1 p24 gene. Additionally nine positive samples were subjected to viral load measurement using COBAS® TaqMan® HIV-1 Test, version 2.0 (v2.0), and five samples were subjected to direct DNA sequencing of p24 gene phylogenetic analysis.

Results: Of the 70 HIV-1 positive samples, 68 (97.1%) and 61 (87.1%) positive samples were detected using RT-LAMP and RT-PCR respectively. Whereas, all the 20 HIV-1 negative samples were confirmed negative by RT-LAMP, 2 (10%) were positive by RT-PCR. Furthermore, the limit of detection (LOD) for both RT-LAMP and RT-PCR assays was determined to be 130 and 325 copies/ml respectively. The viral loads for the nine samples ranged between 1.92E+4 C/ml – 1.04C6/ml. The sequencing of five samples showed similarity of the Sudanese isolates with the neighboring countries Uganda, Saudi Arabia and also Senegal and even more closely sub-grouped with the Tanzanian counterpart.

Conclusion: RT-LAMP was successfully performed under minimal laboratory conditions demonstrating it as a very useful for use in fields setting and limited resources region.

The effects of meteorological variables on bacterial intestinal infectious disease related to emergency room visits in Seoul, South Korea

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Objectives: To better understand the effects of meteorological factors (average air temperature (°C), relative humidity (%), average precipitation level (mm) and average wind speed m/s) on weekly reported emergency room visits of all bacterial enteritis (ICD-A00 to ICD-A05) obtained from 30 hospitals in Seoul, South Korea from 2009 to 2014.

Methods: After controlling for potential confounding factor, GAM generalized additive model was used to evaluate the association between weekly emergency room visits (data were extracted from NEDIS data-base) and meteorological factors (data were received from Korea meteorological administration). Both single day and distributed lag models were explored over a previous one and two weeks.

Results: Weekly emergency room visits reported cases are 2646 (53% is female), distributed as ICD's codes (ICD-A00 Cholera 29, ICD-A01 Typhoid and paratyphoid fever 58, ICD-A02 Salmonella infection 140, ICD-A03 Shigellosis 32, ICD-A04 Other bacterial intestinal infection 1954 and ICD-A05 Other bacterial foodborne intoxication 450), most reported cases under age group 19–64 years (51%) and least group under age 7–12 years old (5%). A statistically significant positive association existed only between emergency bacterial enteritis cases and bacterial enteritis cases. The cumulative summary of Relative Risk estimated for average air temperature above 10 °C is 1.008 (95% CI: 1.01 to 1.003) and below 10 °C is 0.97 (95% CI: 0.99 to 0.96), and for an Excess Risk estimated (for 1 °C increase above 10 °C being 0.85% (95%CI: 1.3% to 0.40%) increase in ER visits and a negative effect was observed for air temperature below 10 °C, for increase 1 °C was −2.4% (95% CI: −0.85% to −3.9%).

Conclusion: This study suggests that air temperature has an effect of ER visits related to bacterial enteritis, while other meteorological factors (relative humidity, average precipitation level and average wind speed) were observed statistically non-significant.

Epidemiologic characteristic of human Middle East respiratory syndrome in Saudi Arabia, 2015–2017

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Objective: To estimate the incidence and mortality of human Middle East respiratory syndrome (MERS) cases by demographic characteristics, regions and sources of infection in Saudi Arabia.

Methods: MERS cases and their characteristics were extracted from two data sources; World Health Organization and Ministry of Health, Saudi Arabia. The incidence and mortality per 100,000 were calculated by age, gender and region. We also compared the epidemiologic characteristics by source of infection.

Results: Total 829 cases from 2015 to 2017 were recruited in this study. Incidence of MERS infection was 1.44, 0.65, and 0.54 case/100,000 population for 2015, 2016 and 2017 respectively. The mean age of cases was 55 years, highest incidence rate was founded among age group 50–59 years old (22.5%), and lowest incident in age group ≤ 19 years. Male gender is more likely to be infected with 73.5% of all cases. Majority of incident rate was

reported in Riyadh region (50.36%), and minority was in Jazan region (0.12%). The generation of infection was determined from three main sources; Primary infection was 24.16% (camel contact and/or consumption of their raw milk), Secondary infection was 38.34% (hospital acquired 92.16% and community acquired 13.48%) and un-identified source 37.5% of all cases.

MERS infection caused 368 death among 829 cases (case fatality rate CFR = 44.4%) for all the period. The mortality rate according to the source of infection was; un-identified source (44%), secondary infection (32.6%, including 97.5% hospital acquired), and primary infection (23.4%).

Conclusion: Incident and mortality rates were found significantly decreased from 2015 to 2017. Age group and source of infection demonstrated high risk population. Identification of MERS epidemiological characteristics support the control plan and preventive measures for improving public health impact in Saudi Arabia.

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Descriptive Epidemiology, Clinical Characteristics and Outcomes for Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infected Patients in AlAin – Abu Dhabi Emirate

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Introduction: MERS-CoV was first identified in 2012 and highest incidence was in Saudi Arabia, followed by Republic of Korea and UAE. The majority of reported cases are males. Patients with comorbidities have higher mortality rate. The source of MERS-CoV infection is linked to camel exposure, nosocomial and human-to-human transmission. The clinical course of MERS-CoV infection can vary from asymptomatic disease to septic shock with multi-organ failure (MOF). We studied the clinical characteristics and outcomes of MERS-CoV infected patients in AlAin – UAE.

Method: A retrospective multicenter chart review study for MERS-CoV confirmed cases by RT-PCR at Tawam and AlAin Hospitals over 6 years period (2012 – 7/ 2018). Epidemiological, demographic, clinical and laboratory data were collected and analyzed using descriptive analysis.

Results: A total of 58 individuals were identified, 41 males (70.6%) with median age of 43.5 years. The majority of patients were asymptomatic carriers or having mild symptoms (34 [58%]) and were previously healthy. The comorbid conditions were hypertension (18[31%]), diabetes mellitus (11[18.9%]), coronary artery disease (6[10.3%]), and chronic kidney disease (9 [15.5%]). The risk factors for MERS-CoV infection were camels contact (5[8.6%]), travel 5 [8.6%](Oman 2, Saudi Arabia 3) and human-to-human contact with MERS-CoV infected patient or nosocomial transmissions (40 [68.9%]). Common symptoms at presentation were fever 46.5%, myalgia 41.3%, respiratory symptoms 41.3%, and gastrointestinal symptoms 22.4%. The mean duration of viral shedding was 18.5 days. Twelve patients (20.6%) required ICU care for septic shock, acute respiratory failure and acute kidney injury (AKI) requiring renal replacement therapy. The mortality rate was 12% and only noted among ICU admitted cases.

Conclusion: In this study of MERS-CoV, human-to-human and nosocomial transmissions were more common than camel contact. In keeping with previous studies, most patients had mild symptoms, however, the mortality rate among adult ICU admissions was high (12%).

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The yield of blood cultures performed at Tawam Hospital for all children from all department

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All blood cultures (BCs) were taken from January 2013 up to June 2013 for children from birth up to 15 years old at Tawam hospital. A retrospective cross-sectional descriptive analytic study was performed to them. One hundred seventy one (6%) were yielded from 3015 BCs. These organisms were classified into true bacteremia (62%) and false positive cultures (38%). The true bacteremia was compared with negative cultures by gender, age groups, fever, and the presenting condition of the child, oncology patient, immunodeficiency patient, and any child having indwelling catheter or other devises and any cardiovascular abnormality to evaluate the difference. Most of these risk factors had statistical significant of the difference except neonate and the presence of VP- shunt. The following organisms were yielded; from gram positive cocci (70% of all organisms) were coagulase –ve Staphylococcus (19% of BCs), Staphylococcus epidermidis (15% of BCs) and both Streptococcus pneumoniae and viridans (3.6% of BCs for both), from gram –ve rods (14% of BCs) were Klebsiella pneumoniae (5% of BCs) and Acinetobacter spp.(3.5% of BCs) and from non-bacteria organism was Candida spp. (6% of BCs).

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Latent Tuberculosis Screening Using T-Spot-TB Test Among People Living With HIV: A Retrospective Study Of 190 Patients At A Tertiary Care Hospital In Dubai, UAE

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Background: It is estimated that one third of 33.3 million people living with HIV worldwide are infected with TB. Overall mortality is twofold higher for HIV/TB co-infected individuals compared to those with isolated HIV infection. Consequently, diagnosis of latent TB infection (LTBI) and provision of chemotherapy to those testing positive is strongly recommended. This article reviewed the epidemiology of LTBI among adult people living with HIV following up in a tertiary care center in Dubai, United Arab Emirates (UAE).

Methods: A retrospective study included all HIV-infected patients who were screened for LTBI using T-SPOT test at Rashid hospital, Dubai from January 2016 until December 2016, through medical records. Patient with active TB either during study period or in past were excluded.

Results: 209 patients with HIV were evaluated and 190 were included in analysis. 52(27%) were female and 138 (73%) were male. 140/190 (74%) of patients were UAE national, 24/190 (12%) were African and 15/190 were from other Arab countries. T-SPOT was reactive in 33/190 (17%) of cases, 155/190 (82%) were nonreactive and only 2/190 (1%) patients had an indeterminate result. There was no statistically significant association between low CD4+ T-cell count, viral load and T-SPOT reactivity. Over 70% of patients in both arms have suppressed HIV viral activity with viral load below 50 copies/ml. A CD4 cell count less 200 cells/mm3 was observed in less than 30% of cases in each group, whereas over 30% of patients in each group had a CD4 cell count of more than 500 cells/mm3. Twenty one (68%) patients with reactive T-SPOT were offered preventive therapy.