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Location: Area G, Hall D (North Building, Lower Level), MOSCONE CENTER

**Middle East Respiratory Syndrome Associated With Higher Mortality, More Severe Illness**

ATS 2016, SAN FRANCISCO — Patients with Middle East Respiratory Syndrome (MERS) develop more severe critical illness and have higher mortality than patients with non-MERS severe acute respiratory infection (SARI), according to investigators involved with the largest study of critically ill patients with MERS. The study was presented at the ATS 2016 International Conference.

Until March 20, 2016, 1690 cases of MERS had been reported to the World Health Organization, with 80 percent of those cases in Saudi Arabia. The reported cases had an overall mortality of 35 percent. The investigators – led by Yaseen Arabi, MD, chairman, Intensive Care Department, and professor, College of Medicine, King Saud bin Abdulaziz University for Health Sciences and King Abdullah International Medical Research Center, Riyadh, Saudi Arabia – embarked on their research because few studies have examined the clinical course of critically ill patients.

They collected data from 14 hospitals in 4 cities in Saudi Arabia and compared critically ill patients with laboratory-confirmed MERS to those admitted with SARI of non-MERS etiology during a similar period.

A total of 299 MERS patients with SARI were admitted to the participating ICUs and were compared with 218 patients with SARI only. Patients with MERS were younger (median age, 58 years) compared with non-MERS patients (median age, 70 years). There were a number of chronic morbidities common in both groups, including diabetes and liver disease. Symptoms such as cough, shortness of breath, and sputum production were also similar.

“Patients with MERS were more likely to be hypoxemic and to require invasive mechanical ventilation (85 percent versus 73 percent,  $p = 0.001$ ), vasopressor therapy (77 percent versus 55

percent,  $p = 0.001$ ), and renal replacement therapy (47 percent versus 23 percent,  $p = 0.001$ ),” the investigators wrote. Mortality was higher in MERS versus non-MERS patients (70 percent versus 36 percent,  $p = 0.001$ ).

“There is a substantial overlap in clinical presentation and co-mortalities among patients with MERS and SARI of other etiologies, making diagnostic testing an essential component of SARI investigation of at-risk patients,” the authors concluded.

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Abstract 9954

Critically Ill Patients With the Middle East Respiratory Syndrome (MERS): A Multicenter Study

Type: Scientific Abstract

Category: 15. ICU Management and Administration / Adult / Behavioral/Epidemiology/Health Services / Critical Care (CC)

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## Abstract Body

### Rationale:

As of October 2015, 1595 cases of MERS have been reported to the WHO; 80% from Saudi Arabia with a high overall mortality (35%). Few studies have examined the clinical course of critically ill patients; most from a single-center and without a comparison group. Therefore, it remains unclear whether clinical presentations, co-morbidities and outcomes differ from severe acute respiratory infection (SARI) cases of other etiologies.

### **Methods:**

Data were collected from 14 hospitals in 4 cities in Saudi Arabia using the International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC) case report forms. Participating hospitals had a median of 550 beds (Q1-Q2, 485-1150) with 42 ICU beds (Q1-Q2, 30-61). We compared critically ill patients with laboratory-confirmed MERS to those admitted SARI of non-MERS etiology during a similar period, using a prospective collected SARI database at KAMC-RIYADH.

### **Results:**

Between 9/2012 and 9/2015, a total of 299 MERS patients with SARI were admitted to the participating ICUs and were compared to 218 non-MERS patients with SARI. The MERS patients were generally younger than non-MERS patients (median age 58 [Q1-Q3: 46-70] versus 70 [Q1-Q3: 51-79,  $p=0.001$ ]). Chronic comorbidities were highly prevalent in both groups. Diabetes (49% vs 52%) and moderate-to-severe liver disease (5% vs 6%) were not different between the two groups. Chronic cardiac disease was less frequent (42% vs. 56%,  $p=0.001$ ) while chronic renal disease was more common in MERS patients (31% vs 22%  $p=0.027$ ). Fever was more common in MERS than non-MERS patients (71% vs 41%  $p=0.001$ ). Other symptoms (cough, shortness of breath, sputum production) were similar. Patients with MERS were more likely to be hypoxemic and to require invasive mechanical ventilation (85% vs 73%,  $p=0.001$ ), vasopressor therapy (77% vs 55%,  $p=0.001$ ) and renal replacement therapy (47% vs 23%,  $p=0.001$ ). Viral pathogens (other than MERS-CoV) were identified in 4% of MERS patients and 24% of non-MERS patients; including influenza A and B (H1N1 included), coronavirus-HKU1, rhinovirus and others. Mortality was higher in MERS compared to non-MERS patients (70% vs 36%,  $P=0.001$ ).

### **Conclusions**

This is the largest study of critically ill patients with MERS. Patients with MERS develop worse hypoxia, more severe critical illness, and have substantially higher mortality than patients with non-MERS SARI. There is a substantial overlap in clinical presentation and co-mortalities among patients with MERS and SARI of other etiologies, making diagnostic testing an essential component of SARI investigation of at-risk patients.