Doctors develop Ebola virus diagnostic tool

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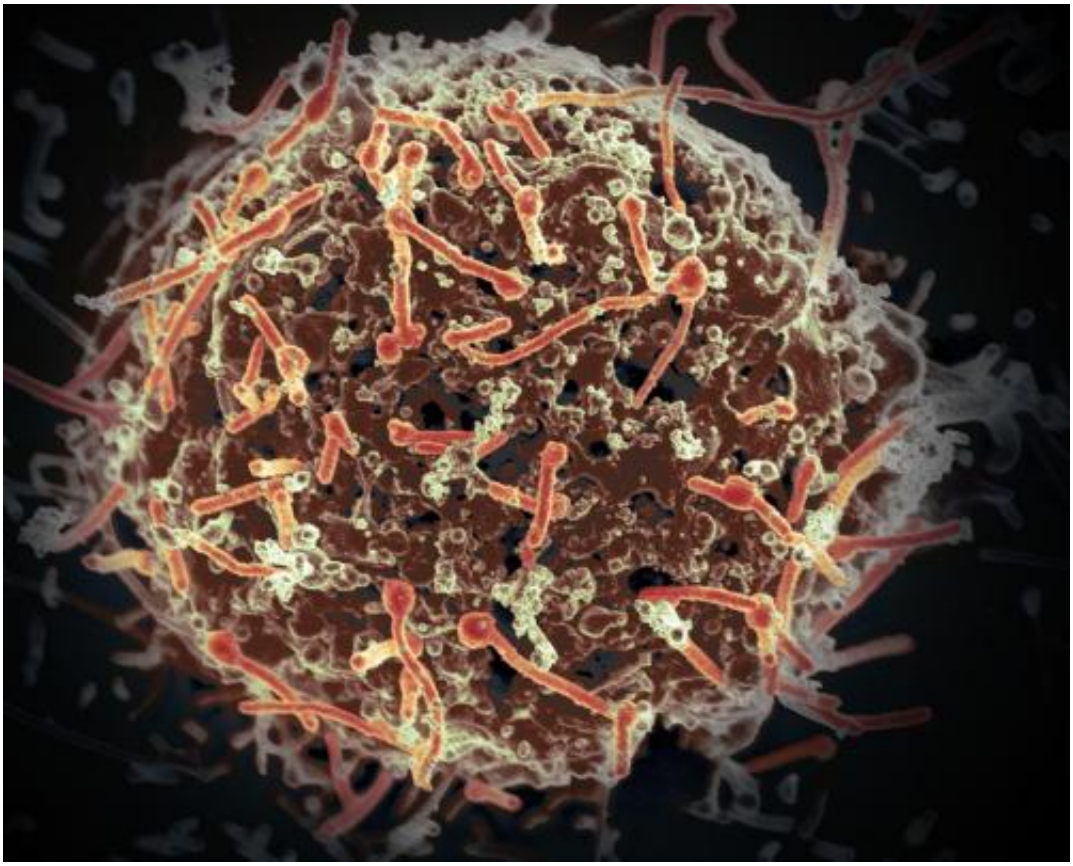

The Ebola virus, isolated in November 2014 from patient blood samples obtained in Mali. The virus was isolated on Vero cells in a BSL-4 suite at Rocky Mountain Laboratories. Credit: NIAID

Adam C. Levine, M.D., an emergency medicine physician at Rhode Island Hospital and The Miriam Hospital who treated Ebola-infected patients in Liberia last year, used his field experience to create a tool to

determine the likelihood that patients presenting with Ebola symptoms will actually carry the virus. His research was published in the *Annals of Emergency Medicine* today.

Ebola Virus Disease (EVD) has affected 24,000 persons during the current epidemic, which is the largest recorded outbreak of EVD in history. Over 10,000 people have died in West Africa, mainly in Sierra Leone, Liberia and Guinea.

Because the initial symptoms are not specific to EVD, diagnosing EVD remains a significant challenge. This is the first time that researchers scientifically derived a clinical prediction model, the Ebola Prediction Score, for patients with suspected EVD who await laboratory confirmation.

"There is a lag time between a suspected case and a confirmation," said Levine, who volunteered in Liberia through the humanitarian organization, International Medical Corps, helping set up their first Ebola Treatment Unit (ETU) in Bong County. "The Ebola Prediction Score will help clinicians risk-stratify patients already meeting one or more suspect definitions of EVD."

Typical predictors for EVD include fever, nausea/vomiting, diarrhea, fatigue, abdominal pain, loss of appetite, muscle pain, joint pain, headache, difficulty breathing, difficulty swallowing, hiccups, unexplained bleeding, and exposure to a suspected or confirmed EVD patient within 21 days. In Levine's Ebola Prediction Score tool, six of those symptoms create the model—sick contact, diarrhea, loss of appetite, muscle pain, difficulty swallowing and absence of abdominal pain. A scoring system based on these signs may help clinicians determine who is most likely to require isolation while laboratory tests confirm diagnosis.

"Admitting a patient to an ETU in a rural setting or to a community-based isolation center who is unlikely to have EVD puts that patient at risk for exposure," said Levine. "Determining which patients to admit for definitive testing and treatment required balancing the epidemiologic imperative to break the train of transmission in the community against the ethical imperative to 'do no harm' to each individual patient, all within the context of severe resource constraints."

Patient data was collected during routine clinical care at the 52-bed Bong County ETU in Liberia during its first 16 weeks of operation. EVD testing results were available for 382 of the 395 patients admitted to the ETU during the study period. Forty-two percent, or 160 patients, tested positive for EVD.

According to Levine, while the Ebola Prediction Score can help determine who is more likely to have EVD and treat them accordingly, better testing needs to be a focus. "Given the inherent limitations of clinical prediction models... a low-cost, point-of-care test that can rapidly and definitively exclude EVD in patients should be a research priority," he said.

More information: www.annemergmed.com/article/S0 … (15)00217-6/fulltext

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