functions and show heightened susceptibility to atheroma development and conditions that would favor thrombus accumulation.[3] I fully endorse their assertion of the importance of primary prevention strategies for coronary artery disease.

Kounis cites the pioneering morphologic studies by Constantinides and Harkey that showed open junctions between endothelial cells over human plaques. Since these classic studies, substantial data have highlighted qualitative abnormalities in endothelial function rather than desquamative injury, or physical discontinuities between junctions, as a mechanism of inflammatory-cell recruitment.[3] The expression of selective adhesion molecules on the surface of endothelial cells that have undergone activation by risk factor–related stimuli, and local elaboration of chemoattractant molecules, lead to leukocyte accumulation in lesions, according to current evidence. I agree completely regarding the potential contributions of mast cells and their proteases to atherogenesis — indeed, genetic studies in mice rigorously implicate mast cells in experimental atherogenesis.[4]

I further concur with the points raised regarding the roles of mast-cell–derived proteases in the activation of MMPs. In addition to the mast-cell–derived enzymes chymase and tryptase, other serine proteases, including some involved in blood coagulation, such as plasmin and thrombin, can also activate the zymogen forms of MMPs.[5]

Peter Libby, M.D.
Brigham and Women's Hospital
Boston, MA
plibby@rics.bwh.harvard.edu

Since publication of his article, the author reports no further potential conflict of interest.

1. Inzucchi SE, Bergenstal RM, Buse JB, et al. Management of hyperglycemia in type 2 diabetes: a patient-centered approach: position statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care 2012;35:1364-79.
2. Tardif JC, McMurray JJ, Klug E, et al. Effects of succinobucol (AGI-1067) after an acute coronary syndrome: a randomised, double-blind, placebo-controlled trial. Lancet 2008;371:1761-8.
3. Gimbrone MA Jr, García-Cardeña G. Vascular endothelium, hemodynamics, and the pathobiology of atherosclerosis. Cardiovasc Pathol 2013;22:9-15.
4. Sun J, Sukhova GK, Wolters PJ, et al. Mast cells promote atherosclerosis by releasing proinflammatory cytokines. Nat Med 2007;13:719-24.
5. Galis ZS, Kranzhöfer R, Fenton JW II, Libby P. Thrombin promotes activation of matrix metalloproteinase-2 produced by cultured vascular smooth muscle cells. Arterioscler Thromb Vasc Biol 1997;17:483-9.
DOI: 10.1056/NEJMc1307806

Middle East Respiratory Syndrome Coronavirus Infections in Health Care Workers

TO THE EDITOR: A majority of the 94 cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection that have been reported to date have occurred in Saudi Arabia. Patients with this infection have presented with serious respiratory disease and have required hospitalization.[1,2] However, there have been case reports of less severe disease within family[3,4] and hospital[2] clusters, and the clinical spectrum of MERS-CoV infections may extend to asymptomatic and subclinical cases. Therefore, the epidemiologic and clinical characteristics of this infection need further definition. The patterns of the spread of MERs-CoV among family[3,4] or hospital[2] clusters suggest that transmission occurs through droplets or contact. We previously reported two cases of MERS-CoV infection in health care workers,[2] one of which was fatal.

The presence of asymptomatic or subclinical MERS-CoV infections in the community or among health care workers could have important public health implications, since these infections may be sources of transmission to close contacts in the community or to patients with coexisting medical conditions. The close proximity of health care workers to patients and the handling of human biologic material (sputum, respiratory secretions, feces, urine, or blood) may increase the risk of transmission, and health care workers may be particularly at risk for MERS-CoV infections.

The Saudi Arabian Ministry of Health routinely screens all close contacts of patients in whom MERS-CoV infection has been diagnosed, and more than 3000 people have been screened to date. We recently identified seven health care workers with MERS-CoV infection (two of whom were asymptomatic and five of whom had mild upper respiratory tract symptoms) through screening of single sample nasopharyngeal swabs

Table 1. Characteristics of Health Care Workers with Confirmed MERS-CoV Infection.*

Characteristic	Health Care Worker						
	1	2	3	4	5	6	7
Age (yr)	42	29	46	39	59	28	56
Sex	Female	Female	Female	Female	Female	Female	Female
Result of chest radiography	Normal	Normal	Normal	Normal	Normal	Normal	Normal
MERS-CoV PCR test	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Viral load (Ct value)	33	37	38	34	35	30	37
Coexisting condition							
Diabetes mellitus	Yes	No	No	No	No	No	No
Other	No	No	No	No	No	No	No
Symptoms							
Feverish feeling	Yes	No	Yes	No	No	Yes	Yes
Fever, measured	Yes	No	No	No	No	No	No
Cough	Yes	No	No	No	No	No	Yes
Sore throat	Yes	No	Yes	No	No	Yes	Yes
Runny nose	No	No	Yes	No	Yes	Yes	Yes
Muscle aches	Yes	No	Yes	No	No	No	Yes
History of exposure	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* For more details, see the table in the Supplementary Appendix, available with the full text of this letter at NEJM.org. Ct denotes cycle threshold, MERS-CoV Middle East respiratory syndrome coronavirus, and PCR polymerase chain reaction.

by means of a real-time reverse-transcriptase–polymerase-chain-reaction (RT-PCR) amplification test, with amplification targeting both the upstream E protein gene (*upE*) and open reading frame 1a (*ORF1a*) for confirmation. A patient was confirmed as having MERS-CoV infection if both assays were positive. Table 1 outlines the clinical characteristics of these seven health care workers, and Table S1 in the Supplementary Appendix, available with the full text of this letter at NEJM.org, summarizes their level of contact with patients and the infection-control procedures undertaken. Some of the nurses did not follow infection-control procedures fully and therefore had maximal exposure. All the infected nurses were women, and all had previously been healthy except for one who had diabetes. Two had asymptomatic cases of MERS-CoV infection, one had only a runny nose, and four reported mild symptoms. They did not require treatment, recovered fully within a week, and remained healthy on follow-up. On daily follow-up PCR testing, six of seven tested positive for MERS-CoV on day 2 and negative on day 3; one remained positive until day 8. There was no history of exposure to animals or to persons with MERS-CoV infection in the community, and no subsequent cases of MERS-CoV were associated with these seven health care workers.

A family cluster of MERS-CoV was identified in the United Kingdom in early 2013.[4] Screening of 59 health care workers who were in contact with the index patient without observing infection-control procedures did not reveal any MERS-CoV infections. The identification of asymptomatic and subclinical cases of MERS-CoV infection in health care workers brings to light the urgent need to develop a rapid, sensitive, and specific diagnostic test and to conduct studies to accurately define the clinical spectrum of MERS-CoV infection. Maintaining a high awareness of the possibility of MERS-CoV infection and rapidly initiating infection-control measures are important strategies for controlling nosocomial transmission.[2] Health care workers should be reminded of the importance of systematic implementation of infection-prevention and infection-control measures.[5] Several questions remain about the possible infectiousness of body fluids, excreta, and clinical samples and their infectivity and cross-transmission through contaminated surfaces and medical devices to the hands of

health care workers. Hospitals that provide care for patients with suspected or confirmed MERS-CoV infection should take appropriate measures[1-5] to decrease the risk of transmission of the virus to other patients, health care workers, and visitors.

Ziad A. Memish, M.D.
Ministry of Health
Riyadh, Saudi Arabia
zmemish@yahoo.com

Alimuddin I. Zumla, Ph.D.
University College London
London, United Kingdom

Abdullah Assiri, M.D.
Ministry of Health
Riyadh, Saudi Arabia

Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

This letter was published on August 7, 2013, at NEJM.org.

1. Update: severe respiratory illness associated with Middle East respiratory syndrome coronavirus (MERS-CoV) — worldwide, 2012–2013. Atlanta: Centers for Disease Control and Prevention (http://www.cdc.gov/coronavirus/mers).
2. Assiri A, McGeer A, Perl TM, et al. Hospital outbreak of Middle East respiratory syndrome coronavirus. N Engl J Med 2013;369:407-16.
3. Memish ZA, Zumla AI, Al-Hakeem RF, Al-Rabeeah AA, Stephens GM. Family cluster of Middle East respiratory syndrome coronavirus infections. N Engl J Med 2013;368:2487-94.
4. Health Protection Agency (HPA) UK Novel Coronavirus Investigation team. Evidence of person-to-person transmission within a family cluster of novel coronavirus infections, United Kingdom, February 2013. Euro Surveill 2013;18:20427 (http://www.eurosurveillance.org/images/dynamic/EE/V18N11/art20427.pdf).
5. Middle East respiratory syndrome (MERS) — interim guidance for health professionals. Atlanta: Centers for Disease Control and Prevention (http://www.cdc.gov/coronavirus/mers/interim-guidance.html).

DOI: 10.1056/NEJMc1308698

CORRECTIONS

Hospital Outbreak of Middle East Respiratory Syndrome Coronavirus (August 1, 2013;369:407-16). In the Results section, the second sentence under Demographic and Clinical Features (page 412) should have read, "The most common signs and symptoms were fever (in 87% of the patients) and cough (in 87%) . . . ," rather than ". . . and cough (in 89%) . . . ." In Question 1 of the Continuing Medical Education examination associated with this article (page 495), choice A should have read, "Shortness of breath," rather than "Cough." The article and the examination are correct at NEJM.org.

Genetically Informed Therapy in Leukemia (May 9, 2013;368:1838-9). In the first two sentences of the second paragraph (page 1838), CSF3R is erroneously described as a tyrosine kinase. In the first sentence, the expression "another tyrosine kinase mutation" should be "a mutation," and in the second sentence, the expression "encoding the tyrosine kinase CSF3R" should be "encoding CSF3R." The article is correct at NEJM.org.

NOTICES

Notices submitted for publication should contain a mailing address and telephone number of a contact person or department. We regret that we are unable to publish all notices received. Notices also appear on the Journal's *website (NEJM.org/medical-conference). The listings can be viewed in their entirety or filtered by specialty, location, or month.*

STEM CELL FORUMS

The following forums will be held: "Stem Cells in Translation" (Florence, Italy, Sept. 15–18) and "Stem Cells in Science and Medicine" (Suzhou, China, Oct. 14–17).

Contact the International Society for Stem Cell Research, 5215 Old Orchard Rd., Suite 270, Skokie, IL 60077; or call (224) 592-5700; or fax (224) 365-0004; or e-mail isscr@isscr.org; or see http://www.isscr.org/home/confseries.

19TH ANNUAL RODNEY APPELL UPDATE IN GYNECOLOGIC UROLOGY

The conference will be held in Georgetown, Grand Cayman, Feb. 13–15. Registration deadline is Jan. 31.

Contact Meeting Achievements, 232 E. 500 North, Valparaiso, IN 46383; or call (219) 465-1115; or e-mail polly@meetingachievements.com; or see http://urogynecologycourses.com.

CRRT 2014

The conference, entitled "Acute Kidney Injury: Controversies, Challenges, and Solutions — Advances in Critical Care," will be held in San Diego, CA, March 4–7. It is jointly sponsored by Continuous Renal Replacement Therapies and the University of California San Diego School of Medicine.

Contact CRRT Administration, RES Seminars, 4425 Cass St., Suite A, San Diego, CA 92109; or e-mail res@crrtonline.com; or see http://www.crrtonline.com/conference.

HEAL 2014 (HEARING ACROSS THE LIFESPAN)

The conference, entitled "Early Intervention: the Key to Better Hearing Care," will be held in Cernobbio (Lake Como), Italy, June 5–7.

Contact Meet and Work Srl, Piazza del Sole e della Pace 5, 35031 Abano Terme (Padova), Italy; or e-mail nhs@polimi.it; or see http://www.heal2014.org.

10TH MALAYSIA GENETICS CONGRESS

The congress will be held in Kuala Lumpur, Malaysia, Dec. 3–5. It is presented by the Genetics Society of Malaysia.

Contact Ms. Marcus Chew, 10th Malaysia Genetic Congress, c/o Console Communication, Suite 12.9, Level 12, Wisma UOA II, 21, Jalan Pinang, 50450 Kuala Lumpur, Malaysia; or call (603) 2162 0566; or fax (603) 2161 6560; or e-mail mgc2013@console.com.my; or see http://www.persatuangenetikmalaysia.com.

THE *JOURNAL*'S WEB AND E-MAIL ADDRESSES:

For letters to the Editor: authors.NEJM.org

For information about the status of a submitted manuscript: authors.NEJM.org

To submit a meeting notice: meetingnotices@NEJM.org

The *Journal*'s web pages: NEJM.org