μg/mL]). Of the 9 patients with subsequent laboratory values, serum creatinine levels normalized after an average of 15.9 days postoperatively (range, 10–26 days).

The data provide evidence of systemic tobramycin absorption from ACSs placed during revision joint arthroplasty. This finding suggests that patients receiving an ACS may have prolonged exposure to elevated serum aminoglycoside levels, which could increase the risk of toxicity, including nephrotoxicity. Prospective studies are warranted to determine the true incidence of systemic aminoglycoside absorption from ACSs and the operative and patient risk factors that lead to nephrotoxicity.

Note

Potential conflicts of interest. All authors: No reported conflicts.

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Treatment of Persistent Rhinovirus Infection With Pegylated Interferon α2a and Ribavirin in Patients With Hypogammaglobulinemia

To The Editor—Rhinovirus (RV) is a common causative agent of acute infections. In addition to the common cold, RV infection is associated with acute otitis media, sinusitis, bronchiolitis, asthma, pneumonia, and severe infections, especially in immunocompromised patients [1]. RV infection in patients with chronic obstructive pulmonary disease may cause mortality [2]. In otherwise healthy subjects, RV shedding lasts 7–13 days [3]. No antiviral drug for RV infection is in clinical use.

We have shown that RV may induce persistent lower respiratory tract infections in patients with hypogammaglobulinemia [3, 4]. In addition, chronic RV infections have been reported in lung transplant recipients [5] and during cystic fibrosis [6]. Because RV has been observed to be susceptible to the action of interferon α [7] and because ribavirin potentiates the antiviral effect of interferon α, we treated RV infections in 4 patients who had hypogammaglobulinemia with pegylated interferon α2a and ribavirin.

Three adult patients had common variable immunodeficiency disease, and 1 adult patient had X-linked agammaglobulinemia (Table 1). Despite receipt of adequate immunoglobulin replacement therapy, they all had a history of recurrent or chronic RV infection [4]. Episodes of earlier RV infections in these patients served as self-controls during study of the duration of RV shedding after treatment. Three patients had developed bronchiectasis. At the time of treatment, all patients had respiratory symptoms. For all cases, RV was detected by culture of sputum specimens and by polymerase chain reaction analysis of nasal swab and sputum specimens. After patients provided oral informed consent, we treated them with 180 μg of pegylated interferon α2a (Pegasys, Roche, Welwyn Garden City, United Kingdom) subcutaneously once weekly and with 400 mg of ribavirin (Rebetol, MSD, Hertfordshire, United Kingdom) orally twice daily for 2 weeks.

We found that interferon α2a and ribavirin treatment was associated with rapid decrease and clearance of RV RNA during the case episodes, compared with the self-control episodes. The efficacy of treatment was exemplified by the rapid increase of blood antiviral MxA levels (Supplementary Figure) [8]. Because of chronic respiratory symptoms and concomitant use of antibiotics, the clinical outcome was difficult to adjust. However, 3 patients reported improved quality of life after treatment. Two patients reported fever as an interferon-induced adverse effect. It is of note that all 4 patients developed RV infection 2–12 months after completion of treatment. The cause of the increased susceptibility of patients with hypogammaglobulinemia to RV infection is unknown [4]. Low levels of MxA before treatment suggest deficient RV-induced interferon induction, which has been reported in subjects with asthma and chronic obstructive pulmonary disease [2]. On the other hand, exogenous interferon induced good levels of MxA, suggesting a normal IFN signaling pathway [9].

Interestingly, Falzarano et al [10] recently reported that interferon α2b and ribavirin treatment induced distinct gene expression, reduced viral replication, reduced levels of serum and lung proinflammatory markers, and improved

Table 1. Characteristics of 4 Patients With Hypogammaglobulinemia Treated With Pegylated Interferon α2a and Ribavirin

Age in y, Sex	Diagnosis, Age in y at Diagnosis	Comorbidities	Treatment	Trough Serum IgG Level, g/L[a]	Previous RV RNA Detections, No.	RV RNA Shedding Duration in a Previous Episode, d[b]	Treatment Date	Treated Symptom (s) of RV Infection	RV Shedding Duration Before, After Treatment	MxA Level Before, During Treatment, μg/L	Adverse Effect of Treatment	RV Negativity Duration After Ttreatment mo	New RV Episodes, Onset Date (RV Shedding Duration)
46, male	CVID, 24	ITP, AIHA, bronchiectasis, pulmonary nodules	IVIG	9.2	52	90	10 Oct 2011	Rhinorrhea	12 mo, 2 d	160, 1970	Mild flu-like symptoms	7 mo	15 Jun 2012 (8 wk), 28 Nov 2012 (5 wk)
45, male	CVID, 41	Pernicious anemia, vitiligo	SCIG	9.0	10	21	10 Nov 2012	Cough	0 wk, 3 d	20, 4710	None	2 mo	8 Jan 2013 (3 wk), 4 Oct 2013 (15 d)
59, male	CVID, 29	Pulmonary fibrosis, bronchiectasis	IVIG	7.6	25	57	23 Sep 2013	Cough, rhinorrhea	2 wk, 8 d	40, 400	Low fever	3 mo	19 Dec 2013 (5 wk)
49, male	XLA, 5	Bronchiectasis	SCIG	8.1	30	41	21 Nov 2011	Cough, rhinorrhea	6 wk, 7 d	30, 1220	Fever	6 mo	4 May 2012 (5 wk)

Abbreviations: AIHA, autoimmune hemolytic anemia; CVID, common variable immunodeficiency; IgG, immunoglobulin G; ITP, idiopathic thrombocytopenic purpura; IVIG, intravenous immunoglobulin; RV, rhinovirus; SCIG, subcutaneous immunoglobulin; XLA, X-linked agammaglobulinemia.

[a] Mean trough level during a 2-year period.

[b] Served as self-controls.

clinical outcomes in Middle East respiratory syndrome coronavirus (MERS-CoV)–infected rhesus macaques.

Our preliminary observations in a small group of patients with primary hypogammaglobulinemia, those of Falzarano et al [10] in the treatment of MERS-CoV infection, and vast clinical experience in the treatment of chronic hepatitis C virus infection suggest that the effect of short-term pegylated interferon α and ribavirin treatment for RV infections should be studied, especially in high-risk groups.

Supplementary Data

Supplementary materials are available at *Clinical Infectious Diseases* online (http://cid.oxfordjournals.org). Supplementary materials consist of data provided by the author that are published to benefit the reader. The posted materials are not copyedited. The contents of all supplementary data are the sole responsibility of the authors. Questions or messages regarding errors should be addressed to the author.

Note

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Intentions to Prescribe Preexposure Prophylaxis Are Associated With Self-efficacy and Normative Beliefs

To the Editor—We read with interest the article by Karris et al [1], which describes that although a majority of North American infectious disease physicians (74%) support the provision of human immunodeficiency virus (HIV) preexposure prophylaxis (PrEP) to at-risk individuals, strikingly few (9%) had prescribed PrEP. However, there remains a paucity of data regarding the views of primary care providers, who are best poised to prescribe PrEP to at-risk, HIV-negative patients. We conducted an online survey in December 2012 to understand factors associated with intentions to prescribe PrEP among physicians in the United States. Using a model based on the theory of planned behavior, we hypothesized that physicians' intentions to prescribe PrEP are driven by attitudes, self-efficacy, and normative beliefs [2–4].

Attitudinal questions assessed beliefs regarding PrEP-related safety, efficacy, adherence, antiretroviral resistance, risk compensation, and malpractice and insurance coverage. Self-efficacy questions evaluated physicians' confidence in identifying at-risk patients, prescribing PrEP, and monitoring patients based on the current guidance from the Centers for Disease Control and Prevention (CDC) [5, 6]. Normative beliefs were assessed by perceived peer approval of PrEP prescribing. There was good internal consistency in each domain (Cronbach $\alpha > .70$), and composite domain scores were divided into quartiles for analysis.

Intentions to prescribe PrEP were assessed with the question, "In the next year, how likely are you to prescribe PrEP to the following patients?" asked for 3 populations: men who have sex with men (MSM), at-risk women, and HIV-uninfected patients in serodiscordant relationships. We compared those who responded "very likely" with those who responded "somewhat likely" or "not likely at all" to best characterize early adopters of PrEP prescribing [4].

Email messages with a link to the survey (Supplementary Figure 1) were sent to 5672 physicians in 13 metropolitan areas with the highest HIV incidence selected from the American Medical Association Physician Masterfile, with up to 3 reminder requests over 4 weeks. Of 1545 physicians who opened at least 1 invitation email, 212 clicked on the survey link, 37 were ineligible (not involved in direct patient care or a related specialty), and 146 completed the survey (cooperation rate of 9.7%) [7]. Those who clicked on the survey link were more likely to be <50 years old (62% vs 48%; $P < .001$) and infectious disease physicians (14% vs 3%; $P < .001$).

The majority of respondents were primary care providers (84%) and in private practice (59%). The sample included physicians who practiced family medicine (34%), internal medicine (38%), obstetrics/gynecology (14%), and infectious disease (14%). The average patient population was 57% female, 12% MSM, 2% HIV-infected, and 1% in an HIV-serodiscordant relationship. Most providers had heard of PrEP (86%), nearly half (47%) were aware of CDC guidance on PrEP, and 21% had cared for a patient prescribed PrEP.

Overall, 28% of physicians reported that they would be willing to prescribe PrEP to MSM, 30% to at-risk women, and 45% to HIV-negative patients in serodiscordant relationships in the next year. We used multiple logistic regression to estimate intentions to prescribe PrEP based on domain quartile score, adjusting for significant covariates ($P < .05$) from univariate analyses (having cared for a patient on PrEP or postexposure prophylaxis). Self-efficacy and normative belief scores in the highest quartile were independently associated with intentions to prescribe PrEP, whereas attitudes and other covariates were not (Table 1).

Given the multiple barriers identified by Karris et al [1], our study provides insights that could guide the development of evidence-based interventions to increase PrEP prescribing. Our data support interventions that increase clinician self-efficacy (ie, online risk calculators or adherence monitoring tools) and influence normative beliefs (ie, comprehensive guidelines or endorsement from medical societies). We concur with the conclusion by Karris et al that the success of real-world PrEP will likely require a multifaceted approach [1].

Supplementary Data

Supplementary materials are available at *Clinical Infectious Diseases* online (http://cid.oxford