Cephalosporin-resistant *Neisseria gonorrhoeae* is a major public health concern. *N. gonorrhoeae* of multiantigen sequence type G1407 and multilocus sequence type 1901 is an internationally spreading cephalosporin-resistant clone. We detected 4 cases of infection with this clone in China and analyzed resistance determinants by using *N. gonorrhoeae* sequence typing for antimicrobial resistance.

Gonorrhea, the second most prevalently sexually transmitted infection (STI) globally, remains a major public health concern in China. From 2015 to 2016, the reported cases of gonorrhea in China increased by 14.7% (100,245 to 115,024) ([1](#)). The extended-spectrum cephalosporin ceftriaxone has been recommended as monotherapy to treat gonorrhea in China since 2007 ([2](#)), but resistance to this drug emerged almost at the same time ([3](#)). Presently, the transmission of internationally spread cephalosporin-resistant clones in China has become a threat to effectively controlling gonorrhea ([4](#)). Strains with *N. gonorrhoeae* multiantigen sequence type (NG-MAST) G1407 and multilocus sequence type (MLST) 1901 have been successful clones associated with cephalosporin resistance and have caused clinical treatment failures in France and Spain ([5](#), [6](#)); these strains have also become the predominant clones in the United Kingdom ([7](#)) and Japan ([8](#)) and among US men who have sex with men ([9](#)). Here we report 4 cephalosporin-resistant NG-MAST G1407/MLST 1901 clones identified out of 2,038 isolates collected through China’s Gonococcal Resistance Surveillance Program during 2015–2016.

Demographic and clinical information for the 4 case-patients are summarized in online Technical Appendix Table 1 ([10](#)). All case-patients were adult men; gonococcal isolates were obtained from urethral swab samples. The 4 men had obvious urethral discharge and were diagnosed with acute urethritis. Gram staining and culture of the urethral swabs were positive for gonococcal infection. One of the 4 patients self-reported being a man who has sex with men. One of the infections, occurring in Zhejiang Province, was treated with a single-dose regimen of spectinomycin (4 g); the other 3 infections, occurring in the municipality of Hangzhou, were not performed.

All strains were transferred to the reference laboratory at the National Center for Sexually Transmitted Disease Control, Chinese Center for Disease Control and Prevention. Gram staining, a rapid oxidase reaction test, and a carbohydrate utilization test confirmed the identification of *N. gonorrhoeae*. We determined antimicrobial susceptibility to ceftriaxone (CRO), cefixime (CFM), spectinomycin (SPT), azithromycin (AZM), ciprofloxacin (CIP), and

Cephalosporin-Resistant *Neisseria gonorrhoeae* Clone, China

**Shao-Chun Chen, Yue-Ping Yin, Xiang-Sheng Chen**

Author affiliations: Chinese Academy of Medical Sciences and Peking Union Medical College, Nanjing, China (S.-C. Chen, Y.-P. Yin, X.-S. Chen); Chinese Center for Disease Control and Prevention, Nanjing (S.-C. Chen, Y.-P. Yin, X.-S. Chen)

DOI: https://doi.org/10.3201/eid2404.171817

---

penicillin (PEN) by using the agar dilution method. We detected β-lactamase (penicillinase)-producing \( N. \) \textit{gonorrhoeae} isolates by using a nitrocefin solution filter paper test. These strains were resistant to CRO, CFM, PEN, and CIP but susceptible to AZM and SPT based on susceptibility and resistance breakpoints from the European Committee on Antimicrobial Susceptibility Testing (http://www.eucast.org/clinical_breakpoints) (Table). MICs of ceftriaxone ranged from 0.25 to 0.50 mg/L, and MICs of cefixime ranged from 0.5 to 1.0 mg/L.

We performed NG-MAST and MLST genotyping to identify the sequence types (10). MLST showed all 4 strains to be type 1901, and NG-MAST showed the Zhejiang strain to be sequence type (ST) 10332 and the Chongqing strains to be type 1901, and NG-MAST showed the Zhejiang strain to be type XXXIV and the Chongqing strains to be ST90; however, genomtype of this clone was ST507. All 4 strains had type \( \text{X}_{43} \) sequence type; MGT bull 16/S; resistant S; susceptible SPT; spectinomycin.

The study was supported by grants from the Chinese Academy of Medical Sciences Initiative for Innovative Medicine (2016-I2M-3-021) and the Jiangsu Natural Science Foundation (BK20171133).

**About the Author**
Dr. S.-C. Chen received his PhD in microbiology and is an assistant professor at the National Center for STD Control, Chinese Center for Disease Control and Prevention. His primary research interests include molecular epidemiology and the antimicrobial resistance mechanism of \( N. \) \textit{gonorrhoeae}.

**Table.** MICs of antimicrobial drugs for \( N. \) \textit{gonorrhoeae} isolates from 4 case-patients with cephalosporin-resistant NG-MAST G1407/MLST 1901 infections identified through the national Gonococcal Resistance Surveillance Program, China, 2015–2016*.

<table>
<thead>
<tr>
<th>Case-patient no.</th>
<th>CRO</th>
<th>CFM</th>
<th>CIP</th>
<th>PEN</th>
<th>SPT</th>
<th>AZM</th>
<th>PPNG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5/R</td>
<td>0.5/R</td>
<td>8/R</td>
<td>16/R</td>
<td>16/S</td>
<td>1/S</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>0.5/R</td>
<td>1/R</td>
<td>32/R</td>
<td>16/R</td>
<td>32/S</td>
<td>0.5/S</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>0.5/R</td>
<td>0.5/R</td>
<td>32/R</td>
<td>16/R</td>
<td>32/S</td>
<td>1/S</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>0.25/R</td>
<td>0.5/R</td>
<td>32/R</td>
<td>16/R</td>
<td>64/S</td>
<td>1/S</td>
<td>No</td>
</tr>
</tbody>
</table>

*AZM, azithromycin; CFM, cefixime; CIP, ciprofloxacin; CRO, ceftriaxone; MGT, multilocus sequence type; NG-MAST, \( N. \) \textit{gonorrhoeae} multiantigen sequence type; PEN, penicillin; PPNG, penicillinase-producing \( N. \) \textit{gonorrhoeae}; R, resistant; S, susceptible; SPT, spectinomycin.
Chlamydia trachomatis in Cervical Lymph Node of Man with Lymphogranuloma Venereum, Croatia, 2014

Branimir Gjurašin, Snježana Židovec Lepej, Michelle J. Cole, Rachel Pitt, Josip Begovac

Author affiliations: University Hospital for Infectious Diseases Dr. Fran Mihaljević, Zagreb, Croatia (B. Gjurašin, S.Ž. Lepej, J. Begovac); Public Health England, London, UK (M.J. Cole, R. Pitt); University of Zagreb School of Medicine, Zagreb (J. Begovac)

DOI: https://doi.org/10.3201/eid2404.171872

We report an HIV-infected person who was treated for lymphogranuloma venereum cervical lymphadenopathy and proctitis in Croatia in 2014. Infection with a variant L2b genotype of Chlamydia trachomatis was detected in a cervical lymph node aspirate. A prolonged course of doxycycline was required to cure the infection.

Results from this study were presented as a poster at the IDWEEK 2017 Conference, October 4–8, 2017, San Diego, CA, USA. Abstracts of the IDWEEK 2017 Conference have been published in a supplement issue of Open Forum Infectious Diseases (https://idsa.confex.com/idsa/2017/webprogram/PAPER.html).

Lymphogranuloma venereum (LGV) is a sexually transmitted infection caused by serovars L1, L2, and L3 of the bacterium Chlamydia trachomatis. The infection typically causes genital ulcers, proctitis, or femoral/inguinal lymphadenopathy with or without constitutional symptoms. In the past decade, outbreaks of LGV have been reported in North America, Australia, and Europe, mainly as proctitis among HIV-infected men who have sex with men (MSM) (1). We report a patient with pharyngitis, proctitis, and cervical lymphadenitis in whom LGV-specific DNA was detected by real-time reverse transcription PCR (RT-PCR) in a cervical lymph node fine-needle aspirate.

The patient was a 48-year-old, HIV-positive man in Croatia who came to an outpatient HIV clinic in August 2014 with perianal pain for 10 days and bloody rectal discharge with normal stool consistency. He also reported a painful, enlarged cervical lymph node but did not have a sore throat. On the first day of the illness, he had fever, which subsided the next day. He reported having unprotected receptive anal and oral sex with other men while visiting Berlin, Germany, 2 weeks earlier. Clinical examination demonstrated exudate on the right tonsil, a painful and enlarged right cervical lymph node (5 × 2 cm) (online Technical Appendix Figure, https://wwwnc.cdc.gov/EID/article/24/4/17-1872-Techapp1.pdf), perianal pain on palpation, and a purulent rectal discharge.

The patient was given a diagnosis of HIV infection in 2002 and had been receiving antiretroviral therapy since July 2002. Plasma viremia had been undetectable since October 2002, and his CD4+ T-cell count before this illness was 2,082 cells/mm³. His clinical history included treatment for neurosyphilis, epilepsy, and diarrhea caused by Microsporidiae spp., Blastocystis hominis, and Entamoeba histolytica.

During examination at the HIV clinic, specimens were obtained from the pharynx, rectum, and urine for culture and a nucleic acid amplification test (NAAT). During fine-needle aspiration of a cervical lymph node, ≈1 mL of pus was removed and analyzed. The lymph node aspirate and a rectal swab specimen were positive for C. trachomatis DNA by the C. trachomatis/Neisseria gonorrhoeae RT-PCR (Abbott Laboratories, Abbott Park, IL, USA).

Cytologic examination of the fine-needle aspirate of the affected lymph node predominantly showed elements of granulomatous inflammation. An indirect immunofluorescence assay serum test result for C. trachomatis antibodies was positive (IgG titer >1:512, IgA titer 1:256). Test results for N. gonorrhoeae were negative (culture of the rectal swab and NAAT for urine and rectum). Results of a throat culture for Streptococcus pyogenes and routine lymph node aspirate culture for bacteria were also negative. Serum serologic test results were negative for acute infection with Treponema pallidum, Bartonella spp., and Toxoplasma gondii.