2013-04-01-016 FW: PRO/EDR> Mycobacterium abscessus - UK: (Eng) Cystic fibrosis, trans.

To: (04) Mycobacterial diseases; (09) Resistance of microorganisms;

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MYCOBACTERIUM ABSCESSUS - UK: (ENGLAND), CYSTIC FIBROSIS, TRANSMISSION
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A ProMED-mail post
<http://www.promedmail.org>
ProMED-mail is a program of the
International Society for Infectious Diseases <http://www.isid.org>

[1]
Date: Sat 30 Mar 2013
Source: The Sydney Morning Herald National [edited]
<http://www.smh.com.au/national/health/superbug-threat-rises-with-proof-of-infection-20130329-2qyy0.html>

Researchers have confirmed long-held fears that a drug-resistant bug, which is increasingly common in Australia, can spread from person to person. In a finding that could carry implications for how hospitals control infections, British researchers have provided the 1st proof that the debilitating bug, called _Mycobacterium abscessus_, can be transmitted between patients.

The bug, which causes an accelerated decline in lung function and can prevent safe lung transplantation, has become increasingly prevalent in Australia over the past decade, a previous study found. It must e
treated with an extended course of a poorly-tolerated combination of antibiotics, and treatment often fails. The findings, published in The Lancet on Friday [29 Mar 2013], come as a Senate committee examines Australia's response to the problem of drug-resistant infections.

The researchers conducted DNA analysis of samples collected from 31 patients at a cystic fibrosis centre in Britain and concluded the bug had frequently been transmitted between patients, despite strict
infection control measures. Previously, it had been thought people caught the bug from their environment. England's chief medical officer Dame Sally Davies recently called for worldwide action to combat
antibiotic-resistant bacteria, declaring superbugs posed a "catastrophic threat" to human health that should be likened to terrorism.

Greens Senator Richard di Natale, a medical doctor who instigated the Senate inquiry, said the emergence of superbugs was "one of the great health challenges of this decade." The federal government recently set up a committee to look at the problem.

[Byline: Dan Harrison]
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Communicated by:ProMED-mail Rapporteur Mary Marshall

[This news report refers to a recent publication online in the Lancet, the abstract of which has been extracted below. - Mod.ML]

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[2]
Date: Fri 29 Mar 2013
Source: The Lancet, Early Online Publication [edited]
<http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(13)60632-7/abstract>

Whole-genome sequencing to identify transmission of _Mycobacterium abscessus_ between patients with cystic fibrosis: a retrospective cohort study. Bryant JM, Grogono DM, Greaves D, Foweraker J, Roddick I, Inns T, Reacher M, Haworth CS, Curran MD, Harris SR, Peacock SJ, Parkhill J, Floto RA.

Summary

Background: Increasing numbers of individuals with cystic fibrosis are becoming infected with the multidrug-resistant non-tuberculous mycobacterium (NTM) _Mycobacterium abscessus_, which causes
progressive lung damage and is extremely challenging to treat. How this organism is acquired is not currently known, but there is growing concern that person-to-person transmission could occur. We aimed to define the mechanisms of acquisition of _M. abscessus_ in individuals with cystic fibrosis.

Method: Whole genome sequencing and antimicrobial susceptibility testing were done on 168 consecutive isolates of _M abscessus_ from 31 patients attending an adult cystic fibrosis centre in the UK between 2007 and 2011. In parallel, we undertook detailed environmental testing for NTM and defined potential opportunities for transmission between patients both in and out of hospital using epidemiological
data and social network analysis.

Findings: Phylogenetic analysis revealed 2 clustered outbreaks of near-identical isolates of the _M. abscessus_ subspecies _massiliense_(from 11 patients), differing by less than 10 base pairs. This variation represents less diversity than that seen within isolates from a single individual, strongly indicating between-patient transmission. All patients within these clusters had numerous opportunities for within-hospital transmission from other individuals, while comprehensive environmental sampling, initiated during the outbreak, failed to detect any potential point source of NTM infection. The clusters of _M. abscessus_ subspecies _massiliense_showed evidence of transmission of mutations acquired during infection of an individual to other patients. Thus, isolates with constitutive resistance to amikacin and clarithromycin were isolated from several individuals never previously exposed to long-term macrolides or aminoglycosides, further indicating cross-infection.

Interpretation: Whole genome sequencing has revealed frequent transmission of multidrug resistant NTM between patients with cystic fibrosis despite conventional cross-infection measures. Although the exact transmission route is yet to be established, our epidemiological analysis suggests that it could be indirect.
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Communicated by: ProMED-mail <promed@promedmail.org>

[_Mycobacterium abscessus_ (formerly _M. chelonae_ subspecies abscessus_) is an acid-fast bacillus that is part of a grouping separate from _M. tuberculosis_ complex and known as non-tuberculous
mycobacteria (NTM) (<http://www.cdc.gov/hai/organisms/mycobacterium.html>). NTM differ among themselves on the basis of in vitro growth rate, colonial pigmentation and rapid molecular diagnostics. Non-pigmented, rapidly growing mycobacteria species (RGM) produce mature growth on agar plates within 7 days of incubation and include the _M. fortuitum_complex and the _M. chelonae-abscessus_ group. A subset _M. abscessus_group has been recognized and includes _M. abscessus_ sensu stricto, _M. massiliense_ and _M. bolletii_. Pigmented, intermediately growing NTM require 7-10 days to produce mature growth on agar plates and include _M. marinum_ and _M. gordonae_. Slowly growing NTM, which require more than 7-10 days to produce mature growth on agar plates,include _M. kansasii_ and the _M. avium/intracellulare_ complex. NTM are environmental mycobacteria found in water, soil, and dust that can contaminate medications and products, including medical devices.

Outbreaks of infections due to RGM are generally related to subcutaneous injection of substances contaminated with the bacterium or through invasive medical procedures employing contaminated equipment or implanted devices. (For example, see Padoveze MC, Fortaleza CM, Freire MP, et al. Outbreak of surgical infection caused by non-tuberculous mycobacteria in breast implants in Brazil. J Hosp
Infect 2007; 67: 161-7; abstract available
at <http://www.ncbi.nlm.nih.gov/pubmed/17881086?dopt=AbstractPlus>).

Also, nosocomial RGM infection has followed use of contaminated skin markers in cosmetic plastic surgery (Safranek TJ, et al. _Mycobacterium chelonae_ wound infections after plastic surgery

employing contaminated gentian violet skin-marking solution. N Engl J Med 1987; 317: 197-201; abstract available at <http://content.nejm.org/cgi/content/abstract/317/4/197>). Infection can also occur after accidental injury where the wound is contaminated by soil. RGM also cause disseminated infection in immunocompromised patients.

M. abscessus in particular is a cause of serious lung infections in persons with various chronic lung diseases, such as cystic fibrosis, where it has been a contraindication to lung transplantation (<http://www.sciencedirect.com/science/article/pii/S1053249806003263>). These infections are severe and especially difficult to treat because of the resistance of _M. abscessus_ to many antibiotics. The few drugs that have in vitro activity against _M. abscessus_ include clarithromycin, aminoglycosides, cefoxitin, tigecycline, and imipenem. Recommendations are to combine clarithromycin with at least one other drug, such as an aminoglycoside (usually amikacin) or perhaps one other injectable drug such as cefoxitin or imipenem, depending on results of antimicrobial susceptibility testing (<http://jac.oxfordjournals.org/content/early/2012/01/30/jac.dkr578.full>).

The total duration of therapy that is usually recommended is 6 to 12 or more months (<http://cid.oxfordjournals.org/content/42/12/1756.full>). Localized disease typically responds to 6 months of therapy in immunocompetent hosts, and lung or disseminated infections can require over 6 months of therapy. Surgical resection in patients with areas of focal severe bronchiectasis and/or cavitary disease, aimed at decreasing the mycobacterial load and removing a reservoir of infection, when combined with multidrug antibiotic therapy, has been reported to result in more prolonged microbiologic responses (<http://cid.oxfordjournals.org/content/52/5/565.long>). - Mod.ML

A HealthMap/ProMED-mail map can be accessed at:<http://healthmap.org/r/1lNY>.]

[see also:2012

Non-tuberculous mycobacteria - USA (03): (NY, WA, IA, CO) tattoo 20120826.1264628
Non-tuberculous mycobacteria - USA (02): (NY) tattoo, M. chelonae 20120824.1260129
Non-tuberculous mycobacteria - USA: tattoo, RFI 20120217.1043907
2010

Non-tuberculous mycobacterium, nosocomial - China (02): background 20100128.0308
Non-tuberculous mycobacterium, nosocomial - China: (GD) RFI 20100127.0296
2009

Mycobacterium fortuitum, breast implant - Brazil: (SP) 20090112.0121
2005

Mycobacteriosis, injections- Venezuela 20050503.1224
2004

Mycobacteriosis, plastic surgery - Brazil (Sao Paolo State) 20040719.1962
Mycobacterium abscessus - USA ex Dominican Republic (03) 20040621.1650
Mycobacterium abscessus - USA ex Dominican Republic (02) 20040504.1225
Mycobacterium abscessus - USA ex Dominican Republic 20040501.1200
2003

Mycobacterium abscessus - USA (New York) 20030116.0137
2002

Mycobacterium abscessus - Canada (Ontario) 20021228.6139
2001

Mycobacteriosis, nail salons - USA (California) 20010430.0834]
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