

Pertussis outbreaks in aged-care facilities

The Editor

NSW Public Health Bulletin

Dear Editor

We concur with Al-Murieb and colleagues that pertussis outbreaks are a potential and probably under-recognised problem in aged-care facilities.¹ In February 1999, we investigated an outbreak of acute respiratory infection, which had affected over 50% of the residents of a Sydney nursing home. Serological and virological testing pointed to influenza A as the major cause of illness in 19 of 35 coughing residents.² However, 10 residents also had evidence of recent pertussis infection based on the presence in serum of IgA antibodies to *Bordetella pertussis* detected using an in-house, whole-cell antigen assay, which has been shown not to cross-react with sera containing elevated antibody titres to influenza A virus.³ Of these 10 residents, one demonstrated seroconversion to *Bordetella* IgA on parallel testing of serum samples collected during the outbreak and 7 months earlier.²

Single-sample serological assays have been the mainstay of laboratory diagnosis of pertussis in adults, but recently concerns about poor specificity of some of these assays have been reported.^{3,4} The rapid advance of nucleic acid detection technology has meant that polymerase chain reaction (PCR) assays of high specificity have become widely available in public and private sector pathology laboratories for the diagnosis of pertussis. Early in the infection, the sensitivity of PCR is superior to that of culture; however, this sensitivity, like that of culture, rapidly decreases as the paroxysmal phase progresses.⁵ In Australia in the period 2000–2005, PCR seems to have almost replaced culture in the diagnosis of pertussis in infants and young children, while serology was the means of diagnosis in 80–90% of cases in adults.⁶ Single-sample *Bordetella* serology has a definite place in the evaluation of a coughing illness that has lasted a number of weeks, especially in adults; however, in the setting of an outbreak investigation where cough symptoms have been present for less than 3–4 weeks, PCR should be considered the first line in laboratory diagnosis, if it is available.

Mark J. Ferson

Public Health Unit, South Eastern Sydney Illawarra Area Health Service and School of Public Health and Community Medicine, University of NSW

Peter W. Robertson

SEALS Area Serology Laboratory, Prince of Wales Hospital and School of Medical Sciences, University of NSW

References

1. Al-Murieb A, Brown AM, Raulli A, George C, Gander C, Forrester P et al. Evidence of pertussis clusters in three aged-care facilities in the former Macquarie Area Health Service, NSW. *NSW Public Health Bull* 2008; 19: 157–60. doi:10.1071/NB07054
2. Ferson MJ, Morgan K, Robertson PW, Hampson AW, Carter I, Rawlinson WD. Concurrent summer influenza and pertussis outbreaks in a nursing home in Sydney, Australia. *Infect Control Hosp Epidemiol* 2004; 25: 962–6. doi:10.1086/502327
3. Robertson PW, Goldberg H, Jarvie BH, Smith DD, Whybin LR. *Bordetella pertussis* infection: a cause of persistent cough in adults. *Med J Aust* 1987; 146: 522–5.
4. Public Health Laboratory Network. Pertussis case definition. Canberra: Commonwealth of Australia, 2007. Available from: www.health.gov.au/internet/main/publishing.nsf/Content/cda-phlncd-pertussis.htm (Cited 30 December 2008.)
5. de Melker HE, Versteegh FG, Conyn-Van Spaendonck MA, Elvers LH, Berbers GA, van Der Zee A et al. Specificity and sensitivity of high levels of immunoglobulin G antibodies against pertussis toxin in a single serum sample for diagnosis of infection with *Bordetella pertussis*. *Clin Infect Dis* 1999; 29: 1239–42.
6. Quinn HE, McIntyre PB. Pertussis epidemiology in Australia over the decade 1995–2005 – trends by region and age group. *Commun Dis Intell* 2007; 31: 205–15.

The Editor

NSW Public Health Bulletin

Dear Editor

Ferson and Robertson have pointed out that polymerase chain reaction (PCR) has become, if not the gold standard, at least a silver standard for the diagnosis of pertussis. They recommend that in an outbreak situation of a coughing illness where symptoms have been present for less than 3–4 weeks, PCR should be considered in first-line laboratory diagnosis if it is available. We entirely concur.

In the outbreak in rural NSW in 2004 that we reported, there was little access to timely PCR testing for pertussis. Laboratories encouraged single-point specific IgA assays,

which could be performed locally (or at least regionally), rather than PCR, which was not readily available.

In our investigation, we were concerned about the use of single-point specific IgA because interpretation can be difficult. We used a case definition of positive single-point IgA and a clinically compatible illness. This definition proved to be a robust epidemiological diagnosis.

Around the same time, cases of pertussis were identified in other workplaces. A few of these workplaces responded by asking staff to have a blood test (against our advice). A number of completely asymptomatic people had positive single-point specific IgA, which was not considered evidence of current pertussis infection.

It is interesting to note that pathological testing in the current pertussis epidemic is almost entirely PCR. In the face of large numbers of cases, many general practitioners seem content to make a clinical diagnosis of pertussis, particularly if there is some epidemiological link, and to treat appropriately.

Outbreaks of pertussis continue to occur in institutions and workplaces supporting the need for booster vaccination of adults.

Anthony M. Brown and Ala'a Al-Murieb

Population Health Division, Greater Western Area Health Service