

USE OF ICD-9 DIAGNOSIS CODES IN EPIDEMIOLOGIC SURVEYS MAY SIGNIFICANTLY UNDERESTIMATE THE INCIDENCE AND IMPACT OF INVASIVE PNEUMOCOCCAL DISEASE LOCALLY

Dear Sir,

We read with interest the recent article on the epidemiology of pneumococcal disease among hospitalised patients in Singapore.⁽¹⁾ In that paper, the method used for identifying cases was via retrospective review of records belonging to a national inpatient discharge database using as search terms the International Classification of Diseases, Ninth Revision (ICD-9) codes for pneumococcal disease. The authors from the Ministry of Health found a remarkably low mean annual hospitalisation rate of 10.9 cases per 100,000 population, with only 49 cases of pneumococcal septicaemia and 135 deaths reported in the period between 1995 and 2004.⁽¹⁾

We have archived *Streptococcus pneumoniae* bloodstream isolates cultured from patients admitted to Singapore General Hospital since 1995 and have lately begun the process of typing them. In the period from 2000 to 2007, there were 182 bloodstream isolates in our collection, i.e. 182 cases of pneumococcal septicaemia at one single institution, with 102 cases registered from 2000 to 2004 alone. The attributable mortality rate was 22.5%, and 150 (82.4%) of isolates belonged to serotypes covered by the 23-valent pneumococcal vaccine (data not shown).

Because of the obvious disparity in results, we reviewed the records of these 182 cases and discovered that only 88 (48.4%) had any form of ICD-9 codes for pneumococcal disease as discharge diagnoses. Moreover, the majority of these (56.8%; 50 cases) were coded only as pneumococcal pneumonia without corresponding coding for pneumococcal septicaemia. More importantly, among the 41 case fatalities, only nine (22.0%) had ICD-9 codes denoting pneumococcal disease. This difference in ICD-9 coding accuracy between case fatalities and survivors may have resulted because a significant proportion (36.6%) of deaths occurred within 24–48 hours of hospitalisation, when full culture results were unlikely to be available.

We agree with the authors on the importance of obtaining accurate epidemiological information from ongoing surveillance programmes for the purposes of formulating national prevention and control programmes. While this is not the fault of the authors, the large proportion of pneumococcal cases missed out using ICD-9 codes—especially with regard to case fatalities—has implications on the validity of the results of the study and its utility as a guide towards policy formulation. It is likely that the true incidence of and mortality from pneumococcal infections is far higher than estimated.

Yours sincerely,

Hsu Li Yang

Department of Medicine
National University of Singapore
5 Lower Kent Ridge Road
Singapore 119074
Email: liyang_hsu@yahoo.com

Koh Tse Hsien

Department of Pathology
Singapore General Hospital
Outram Road
Singapore 169608

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