Management of community acquired pneumonia

New studies assess the effectiveness of vitamins for prevention and initial antibiotic coverage for atypical pathogens

Research into community acquired pneumonia has traditionally focused on prognosis and on finding the most effective antibiotic treatment. Little attention has been paid to identifying risk factors for this disease, particularly modifiable ones.

A recent prospective cohort study conducted within the nurses’ health study II measured the effect of dietary and supplemental intake of individual vitamins on the incidence of a first case of community acquired pneumonia in otherwise healthy well nourished women. The participants were 83,165 nurses aged 27-44 in 1991. Dietary information and the occurrence of community acquired pneumonia were assessed every four years through a semi-structured questionnaire. The diagnosis was confirmed by a chest radiograph.

On the basis of 10 years of follow-up and 925 new cases of community acquired pneumonia—and after adjusting for age, body mass index, smoking status, alcohol use, physical activity, and total energy intake—no overall association was found between dietary and supplemental intake of individual vitamins and the incidence of the disease. Subgroup analysis hinted at a possible protective effect of high dietary vitamin E intake in smokers who did not take vitamin E supplements, but overall the study adds to the small amount of evidence indicating that high vitamin intake by well nourished healthy adults does not protect against community acquired pneumonia.

With regard to treatment, the need to cover for atypical pathogens (Mycoplasma pneumoniae, Chlamydia pneumoniae, and Legionella pneumophila) when initially treating community acquired pneumonia in hospital is controversial. Some guidelines (from Canada, Germany, Japan, parts of Latin America, the United Kingdom, and the United States) advocate atypical
coverage, while others (from France, Hong Kong, Saudi Arabia, and South Africa) consider it optional. These discrepancies are largely the result of two unsolved matters—lack of knowledge about the incidence of atypical pathogens as a cause of community acquired pneumonia worldwide and uncertainty about the effect of atypical coverage on clinical outcomes.

A recent study attempted to look at both problems by analysing data from two international databases—the reference laboratory database for atypical pathogens at the University of Louisville and the community acquired pneumonia organisation (CAPO) database. The first of these databases contains data on 4337 patients (from 21 countries) with a laboratory diagnosis of atypical pneumonia. The data were collected during phase III clinical trials of antimicrobials against community acquired pneumonia, carried out by Abbott, Pfizer, and Bristol-Myers Squibb from 1996 to 2004. The CAPO database contains retrospectively collected data (obtained by chart abstraction) on the management of community acquired pneumonia in 2878 patients admitted from 2001 to 2006 to 39 hospitals in 11 countries. Atypical coverage was defined as any antibiotic regimen containing a macrolide, a tetracycline, or a fluoroquinolone. The main clinical outcomes were time to clinical stability, length of hospital stay, total mortality, and mortality related to community acquired pneumonia.

In the University of Louisville database, 22% of patients worldwide tested positive for atypical pathogens. Regional figures ranged from 20% in Asia and Africa to 28% in Europe, with 21% in Latin America and 22% in the US and Canada. The CAPO database showed large variations in the proportion of patients in hospital who were initially treated with a regimen covering atypical pathogens. The figures varied from 91% in the US and Canada to 10% in Asia and Africa, with Europe (74%) and Latin America (53%) lying in between; the global average was 77%. After controlling for factors such as severity of illness and process of care (but not geographical region), patients with atypical coverage were more likely to be clinically stable within one week (hazard ratio 1.26, 95% confidence interval 1.13 to 1.41); they also had decreased total mortality (7% v 11.1%; adjusted odds ratio 0.54, 0.42 to 0.71) but not decreased mortality related to community acquired pneumonia (3.8% v 6.4%; adjusted odds ratio 0.79, 0.52 to 1.21) compared with those without atypical coverage. The administration of antibiotics within eight hours of admission significantly reduced total mortality (odds ratio 0.57, 0.44 to 0.74). The lack of multivariate control for geographical region is unfortunate—residual confounding as a result of this and other undocumented factors may partially explain the results. However, control for severity of illness partially compensates for this.

This study adds to the evidence indicating that initial coverage for atypical pathogens may reduce total mortality. Although some studies have shown no reduction in total mortality, this study indicates that the choice of initial antibiotic in adults admitted to hospital probably has a direct effect on patient outcomes. Consequently, it would be advisable to switch to or add an antibiotic that covers atypical pathogens in patients not initially covered for atypical pathogens who do not improve within two to three days of treatment. The extent to which this applies to the initial treatment of ambulatory patients is not clear, but a high degree of suspicion is warranted.

It remains to be seen whether the evidence from this study will affect guidelines that do not advocate initial coverage for atypical pathogens. The recently updated guideline of the Infectious Diseases Society of America continues to recommend antibiotic regimens offering atypical coverage as initial treatment of both inpatients and outpatients with community acquired pneumonia. The only substantial change in terms of antibiotic regimen is the mention of erythromycin as an alternative to beta-lactams for selected patients. Otherwise, the guideline emphasises problems within the process of care and how diagnostic testing can alter management; it also recommends that antibiotics should be started while patients are still in the emergency department. Immunisation against influenza and pneumococci, smoking cessation, and respiratory hygiene measures are also dealt with. Overall, the guideline provides a wealth of information for clinicians involved in the acute care of patients.

11 IMPACT Working Group. Reducing bacterial resistance with IMPACT—inherithospital multi-disciplinary programmes on antimicrobial chemotherapy. 2nd ed. Hong Kong: Hong Kong University and Hong Kong Hospital Authority, 2001.