Eur Respir J
1988, 1, 929–931

Bacteraemic *Haemophilus influenzae* pneumonia

M.B. Allen, K. Prowse

Bacteraemic Haemophilus influenzae *pneumonia. M.B. Allen, K. Prowse.*
ABSTRACT: Bacteraemia with Haemophilus pneumonia is uncommon. To determine its incidence and features case notes of patients in whom *Haemophilus* spp. were isolated from blood and pleural fluid over a five-year period were reviewed. Eight adult patients with *H. influenzae* bacteraemia were identified, five of whom had pneumonia on clinical and radiographic criteria. Only one patient had a predisposing factor, chronic obstructive lung disease. Two patients had beta-lactamase producing isolates, one of whom developed an empyema, following treatment with ampicillin, which required surgical drainage. Four patients were elderly, aged 69–80 yrs and were clinically in shock at the time of diagnosis. Seven of the eight patients survived.
Eur Respir J., 1988, 1. 929–931.

Dept. of Respiratory Physiology, City General Hospital, Stoke on Trent, Staffs, UK.

Correspondence: Dr. M.B. Allen, Chest Unit, City Hospital, Greenbank Drive, Edinburgh EH10 5SB.

Keywords: Bacteraemia; *Haemophilus influenzae*; pneumonia.

Haemophilus spp. are regularly found in the sputum of normal individuals and patients with chronic bronchitis [1]. In patients with bacterial pneumonia *Haemophilus* spp. may also be found in the sputum, but their pathogenic role is uncertain unless also isolated from blood or pleural fluid [2].

Bacteraemic *Haemophilus* pneumonia is occasionally observed in North America and the incidence is thought to be rising [3], but it is uncommon in Britain [4]. In a prospective study of 453 patients admitted to hospital with pneumonia, 26 were attributed to *Haemophilus* spp. based on sputum isolates, none having positive blood cultures [5].

In an attempt to determine the incidence and clinical features of confirmed (*i.e.* bacteraemic) *Haemophilus* pneumonia we undertook the following retrospective study over the five-year period 1980–1985.

Materials and methods

Bacteriological results from the five-year period between May, 1980 and May, 1985 were examined retrospectively to identify patients with a pure growth of *Haemophilus* spp. from blood and/or pleural fluid. Bacteriology was performed, using standard techniques, in a single laboratory attached to a district general hospital serving a population of 500,000 people. Capsule typing (A–F) was not routinely performed.

The clinical presentation and management was determined from analysis of case notes and chest X-rays, the latter being read independently by both authors and a radiologist.

Results

Forty-eight blood cultures and one pleural aspirate had a pure growth of *Haemophilus influenzae*. Of the positive blood cultures the majority (35) were from children aged under two years. Eight were found in adults (aged 16 yrs or more) and will be considered further.

In three of these eight patients the diagnosis of pneumonia was not confirmed radiographically. One a 60 yr old man admitted for stabilization of chronic heart failure, became hypotensive, (blood pressure 70/0) with basal crackles on auscultation. He died before a chest X-ray was taken, and no autopsy was performed. The two others, a male aged 18 yrs and a female, aged 19 yrs, gave a 14 day and 7 day history respectively, of right-sided pleuritic chest pain and cough productive of purulent sputum. They were both pyrexial with crackles localized to the right lung base and with a neutrophilia, but had normal chest X-rays.

Clinical details of the remaining five patients are shown in table 1. Four developed symptoms at home and represent true community-acquired pneumonia. None received antibiotics prior to admission and only one patient (No. 3) gave a history of mild chronic obstructive lung disease. The remaining patient (No.5) was admitted to hospital three weeks previously because of "failure to cope" at home. The bacteraemia occured when she was fully mobile, a few days prior to discharge.

In patients No. 1 and 2 the isolates of *H. influenzae* from blood, sputum and in one case pleural fluid, were beta-lactamase producing organisms resistant to ampicillin. Patient No.1 was initially treated with ampicillin and gained some symptomatic benefit; chloramphenicol

Table 1. – Clinical details of the five patients with bacteraemic *haemophilus* pneumonia

Patient No.	1	2	3	4	5
Sex	F	F	M	M	F
Age	46	69	73	74	80
Symptoms	Breathless Rt pleuritic pain	Cough Purulent sputum	Cough Purulent sputum	Breathless Purulent sputum	Breathless
Signs	Rt bronchial breathing	Rt bronchial breathing	Crackles Lt upper zone	Crackles Rt base, Lt mid zone	Crackles both bases Rt Lt
Initial blood pressure	160/90	100/60	Unrecordable	90/70	80/46
Chest X-ray	Rt lower lobe consolidation	Rt lower lobe consolidation and effusion	Apical Lt lower lobe consolidation	Rt lower lobe consolidation	Bilateral patchy consolidation Rt>Lt
Underlying medical problem	Nil	Nil	Mild chronic obstructive disease	Nil	Urinary tract infections
Final outcome	Well	Well	Delayed CXR resolution	Well	Died 3 days later

being substituted for ampicillin when sensitivities became available. Patient No. 2 was ill and clinically shocked on admission. Despite intravenous ampicillin and fluid replacement she failed to improve, developing an empyema which required surgical drainage. A beta-lactamase producing *H. influenzae* was isolated from venous blood, sputum and the pus. Oral co-trimoxazole was started and produced a rapid clinical response.

Discussion

We have reported the clinical features of five patients with bacteraemic *Haemophilus* pneumonia over a five-year period. The retrospective nature of the study leaves several aspects open to criticism, including the variation in numbers of blood cultures performed and the amount of information recorded in the case notes. However, the results were from one large hospital with a central bacteriology laboratory and are of interest because little information on bacteraemic *Haemophilus* pneumonia is available in Britain [4].

During the same period a total of 820 patients were admitted with confirmed or probable diagnosis of bacterial pneumonia of which 49 (6%) were due to *Haemophilus* spp. isolated on sputum culture, a figure which accords with other reports [5, 6]. Bacteraemic *Haemophilus* pneumonia is uncommon but is probably underestimated because of prior antibiotic treatment and/or failure to perform blood cultures. Relaxing the diagnostic criteria by identifying a pure growth of *Haemophilus* from tracheal aspirates rather than blood cultures increases the number of cases reported and probably comes closer to the true incidence [7].

Previous reports of bacteraemic *Haemophilus* pneumonia from North America suggest an association with chronic chest disease, alcoholism, diabetes mellitus, hypogammaglobulinaemia and immunosuppression. It occurs predominantly in the right lung, has the type B capsule and is associated with a poor prognosis [2, 3, 7, 8]. The patients in our series were older but not immunocompromised and only one had underlying chronic chest disease.

Bacteraemic *Haemophilus* pneumonia caused by penicillinase producing species is rare in adults [9]. In our series two patients had beta-lactamase producing *H. influenzae* resistant to ampicillin.

For patient No. 2 the delay in starting appropriate antibacterial therapy probably led to the development of an empyema. In view of her poor clinical condition intravenous rather than oral co-trimoxazole would have been more appropriate therapy along with surgical drainage. During the same period about 11% of sputum isolates of *H. influenzae* produced beta-lactamase.

Four patients were clinically in shock at presentation and because of their age had a poor prognosis [5]. However, prompt resuscitation and antibiotic therapy allowed three to be discharged, the fourth dying three days later of heart failure.

In this limited retrospective study we identified eight adult patients with *H. influenzae* bacteraemia, five of whom had pneumonia on clinical and radiographic criteria. Prognosis appears good, with seven patients surviving, despite four being elderly and two having ampicillin resistant isolates.

Acknowledgements: We wish to thank the Bacteriology Department of the North Staffordshire Hospital for their help in identifying patients.

References

1. Smith CB, Golden CA, Kanner RE, Renzetti AD. – *Haemophilus influenzae* and *Haemophilus parainfluenzae* in chronic obstructive pulmonary disease. *Lancet*, 1976, i, 1253–1255.
2. Quintillani R, Hymans PJ. – The association of bacteraemic *Haemophilus influenzae* pneumonia in adults with typable strains. *Am J Med*, 1971, 50, 781–786.
3. Levin DC, Schwartz MI, Matthay RA, La Force FM. – Bacteraemic *Haemophilus influenzae* pneumonia in adults. A report of 24 cases and a review of the literature. *Am J Med*, 1977, 62, 219–224.
4. Ashworth M, Ross G, Loehry C. – Lobar pneumonia caused by *Haemophilus influenzae* type B. *Brit J Dis Chest*, 1985, 79, 95–97.
5. BTS and PHLS. – Community-acquired pneumonia in adults in British hospitals in 1982–1983: a survey of aetiology, mortality, prognostic factors and outcome. *Quart J Med*, 1987, 62, 195–220.
6. Woodhead MA, Macfarlane JT. – *Haemophilus influenzae* pneumonia in previously fit adults. *Eur J Respir Dis*, 1987, 70, 218–220.
7. Tillotson JR, Lerner AM. – *Haemophilus influenzae* bronchopneumonia in adults. *Arch Int Med*, 1968, 121, 482–432.
8. Goldstein E, Daly K, Seamans C. – Haemophilus pneumonia as a cause of adult pneumonia. *Ann Int Med*, 1967, 66, 35–40.
9. Stratton CW, Bradford Hawley H, Horsman TA, Tu KK, Ackley A, Fernando NK, Weinstein M. - *Haemophilus influenzae* pneumonia in adults. Report of five cases caused by ampicillin resistant strains. *Am Rev Respir Dis*, 1980, 121, 595–598.

La bactériémie avec la pneumonie à haemophilus influenzae. *M.B. Allen, K. Prowse.*
RÉSUMÉ: La bactériémie accompagnant la pneumonie à Haemophilus est rare. Pour déterminer son incidence et ses caractéristiques, nous avons revu les dossiers des patients chez qui *Haemophilus* species a été isolé du sang ou du liquide pleural au cours d'une période de cinq ans. Nous avons identifié huit patients adultes avec bactériémie à *Haemophilus influenzae;* cinq d'entre eux avaient une pneumonie sur base de criteres cliniques et radiologiques. Un patient seulement avait un facteur prédisposant, en l'occurrence une bronchopneumopathie chronique obstructive. Deux patients avaient des isolements produisant de la bêta lactamase; un d'entre eux a développé un empyème après un traitement a l'ampicilline, ce qui a requis un drainage chirurgical. Quatre patients étaient âgés de 69 à 80 ans et étaient en état de choc clinique au moment du diagnostic. Sept des huit patients on survécu.
Eur Respir J., 1988, 1, 929–931.