RISK FACTORS FOR ADVERSE OUTCOME IN ADULT PATIENTS WITH INVASIVE PNEUMOCOCCAL DISEASE

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Objectives: The aim of this study was to identify the microbe- and host-related risk factors associated with adverse outcome in adult patients hospitalized with invasive pneumococcal disease (IPD).

Materials: Retrospective study included adult patients in whom S. pneumoniae was isolated from blood, CSF or other primary sterile site; subsequent identification of serotype and antibiotic susceptibility testing was performed at the National Institute of Public Health. Continuous variables are described as medians and interquartile ranges (IQR), categorical variables are described as absolute frequencies and proportions. Continuous variables were compared using Mann–Whitney test and categorical variables with Fisher's exact test.

Results: One hundred and ninety-one cases of IPD have been identified, 114 M and 77 F, with median age 57 years (IQR 45-67). S. pneumoniae was isolated from blood in 168 patients, from CSF in 42 and from other sterile site in 10 cases. The most frequent clinical form of IPD was pneumonia (120 cases; 62.8%), followed by meningitis (55; 28.8%), sepsis without focus (6; 3.1%), primary peritonitis (3; 1.6%), septic arthritis (3; 1.6%) and other form in 4 cases (2.1%). The most frequently isolated serotypes included 3 and 4 (both in 20 cases; 10.5%), 7F (18; 9.4%), 8 and 14 (both 13; 6.8%) and 1 (11; 5.8%). The antibiotic resistance among isolated strains was low, there were 12 strains resistant to tetracycline, 7 to erythromycin; however, no strain was resistant to penicillin. Eighty-three cases of IPD were caused by pneumococcal serotype with high invasive potential and 67 cases by serotype with low invasive potential. The subjects infected by a low invasive strain were older [age median 58 (IQR 47-70) vs. 53 years (37-62), p=0.0307], more often required intensive care [45 (67.2%) vs. 33 (39.8%), p=0.001] and their case fatality ratio was significantly higher [20 (29.9%) vs. 12 (14.5%), p=0.0277]. In total, there were 47 (24.6%) lethal outcomes in our study group. The statistically significant risk factors associated with adverse outcome are listed in the attached table.

Discussion: IPD range among significant causes of morbidity and mortality especially in the elderly and immunocompromised. The results of this study show that these patients are vulnerable especially to infection with low invasive serotypes such as 3, 6A/B, 8, 9N, 19F, 23F; however, these infections are associated with poor outcome. Thus the vaccine for the above mentioned risk groups should target in particular these serotypes. The identification of laboratory and clinical markers associated with adverse outcome could contribute to risk stratification during the initial assessment as well.

	Lethal outcome	Non-lethal outcome	p
Number of cases	47	144	
Age (years)	60 (50-78)	42 (18-56)	0.0257
Immunodeficiency	15 (31.9%)	18 (12.5%)	0.004
Haematological malignancy	9 (19.1%)	6 (4.2%)	0.003
Dyslipidemia	26 (55.3%)	54 (37.5%)	0.041
Atherosclerosis	26 (55.3%)	36 (25%)	0.0003
Cerebrovascular disease	12 (25.5%)	11 (7.6%)	0.0013
Hospital-acquired infection	11 (23.4%)	11 (7.6%)	0.0068
Infection with high invasive serotype	12 (25.5%)	71 (49.3%)	0.0063

	Lethal outcome	Non-lethal outcome	p
	9 (19.1%)	6 (4.2%)	0.003