

# Risk of Pneumonia Recurrence in Patients Previously Hospitalized for Pneumonia – A Retrospective Study (1998–2000)

Marina Polić-Vizintin<sup>1</sup>, Marcel Leppée<sup>1</sup>, Danijela Štimac<sup>1</sup>, Ivan Vodopija<sup>1</sup> and Jasna Cindrić<sup>2</sup>

<sup>1</sup> Zagreb Institute of Public Health, Zagreb, Croatia

<sup>2</sup> Private Practice, Zagreb

## ABSTRACT

Although elderly hospitalized patients, irrespective of the cause of hospitalization, are known to be at a high risk of subsequent development of pneumonia, some studies suggest the risk to be even higher in those hospitalized for pneumonia than in those hospitalized for other diseases. The aim of this retrospective study was to determine the association of hospitalization for pneumonia and some other diseases with subsequent pneumonia morbidity and mortality. The risk of recurrent pneumonia in patients hospitalized for pneumonia was investigated. Rehospitalization of pneumonia patients previously hospitalized for the same disease was followed-up and compared with rehospitalization of patients hospitalized for other diseases during the same study period. The study included patients aged over 18, initially hospitalized in 1998 for pneumonia (J12–J18), or for some particular gastrointestinal (K20–K31) and urogenital diseases (N10–N12, N30–N39). All rehospitalizations for pneumonia in nine Zagreb hospitals were followed-up during a 3-year study period (1998–2000). Out of 975 patients followed-up for rehospitalization, 227 (23.3%) had initially been hospitalized for pneumonia, and 748 (76.7%) for other diagnoses. During the 3-year period, 30 patients were rehospitalized for pneumonia, out of which number 22 had initially been hospitalized for pneumonia, yielding a statistically significant difference between the two study groups ( $\chi^2=34.780$ ,  $p<0.001$ ). The mortality directly caused by pneumonia was also significantly higher in the group of patients with the initial diagnosis of pneumonia than in the group of patients with other diagnoses ( $\chi^2=15.82$ ,  $p<0.001$ ).

**Key words:** pneumonia, rehospitalization, elderly, vaccination

## Introduction

Certain population groups are exposed to an increased risk of pneumococcal disease morbidity and mortality. These groups include the elderly, in whom the immunity and other natural mechanisms of defense (e.g., coughing reflex) are impaired due to the advanced age, which may increase the risk of disease. There are also other contributing factors such as inadequate physical activity, multimorbidity, and inappropriate dietary habits<sup>1</sup>. Some authors refer to advanced age as an independent risk factor<sup>2</sup>, confirmed by the data obtained in a 10-year study conducted in Great Britain by Aszkenasy *et al.*, where more than a half of pneumococcal bacteremia patients were aged  $\geq 65$ <sup>3</sup>. Studies from the United States of America (USA) report on the annual rate of pneumococcal bacteremia in individuals aged  $>65$  to range between 53 and 85/100,000<sup>4</sup>. The pneumococcal

pneumonia mortality is also higher in the elderly, according to some studies ranging between 30% and 43%, which is almost twofold than the one recorded for all age groups taken together<sup>5</sup>.

Pneumococcal disease is more common and more severe in patients with chronic diseases such as cardiac decompensation, nephrotic syndrome, chronic obstructive pulmonary disease, diabetes mellitus, alcoholism, and liver cirrhosis<sup>6</sup>. The risk of pneumococcal disease morbidity and mortality is higher in splenectomized individuals and in those with impaired spleen function. The risk of pneumococcal disease is also increased in individuals with various forms of immunodeficiency, including lymphoma and leukemia patients, patients with other malignancies on chemotherapy, organ transplan-

**TABLE 1**  
TABLE OF CONTINGENCY – PATIENTS HOSPITALIZED FOR PNEUMONIA AND OTHER DIAGNOSES DURING 1998 ACCORDING TO AGE GROUPS, AND  $\chi^2$ -TEST RESULTS

Age (yrs)	Study group		Total
	Pneumonia	Other diagnoses	
18–49	N <sup>a</sup>	30	239
	hp <sup>b</sup>	12.6%	87.4%
	vp <sup>c</sup>	13.2%	27.9%
50–64	N	56	245
	hp	22.9%	77.1%
	vp	24.7%	25.3%
65–84	N	128	456
	hp	28.1%	71.9%
	vp	56.4%	43.9%
85–99	N	13	35
	hp	37.1%	62.9%
	vp	5.7%	2.9%
Total	N	227	975
	hp	23.3%	76.7%
$\chi^2$ -test		$\chi^2=25.047$	df=3
			p<0.001

<sup>a</sup>number of cases; <sup>b</sup>percentage relative to horizontal sum; <sup>c</sup>percentage relative to vertical sum

tation patients, and patients suffering from acquired immunodeficiency syndrome (AIDS and HIV positive individuals)<sup>7</sup>.

Indications for vaccination with polyvalent pneumococcal vaccine are set according to the existence and risk of pneumococcal pneumonia, whereby the ever more common and significant occurrence of antibiotic resistant pneumococcal strains makes the practice of vaccination a highly relevant public health and economic issue<sup>8</sup>.

Although the risk of subsequent pneumonia is known to be increased in elderly hospitalized patients irrespective of the cause of hospitalization, some studies suggest that it is even higher in elderly patients hospitalized for pneumonia than in those hospitalized for other diseases.

The aim of this retrospective study was to determine the relationship of hospital stay for pneumonia and some other diseases with subsequent pneumonia morbidity and mortality. The results of the study were expected to help improve the elderly protection from pneumonia by a set of measures, from health education to target vaccination.

## Materials and Methods

The risk of pneumonia recurrence in patients already hospitalized for pneumonia was investigated during a 3-year period (1998–2000). Rehospitalization of pneumonia patients previously hospitalized for the disease was followed-up and compared with rehospitalization of patients hospitalized during the same period of time for other diseases. The study included patients over 18 years of age, initially hospitalized in 1998 for pneumonia (J12–J18), or for some particular gastrointestinal (K20–K31\*) and urogenital diseases (N10–N12\*\*, N30–N39\*\*\*). All rehospitalizations for pneumonia in nine Zagreb hospitals\*\*\*\* were followed-up by means of citizen identification number. All cases of pneumonia rehospitalized within a month from the initial discharge from hospital were excluded, because they were considered to have been inadequately cured from the previous disease episode rather than suffering from a disease recurrence.

The study subjects were divided into two groups: group 1 (PN) – patients hospitalized for pneumonia (J12–J18); and group 2 (CONT) – patients hospitalized for esophagogastrointestinal diseases (K20–K31), pyelonephritis (N10–N12) and other urinary tract diseases

\* K20 Esophagitis, K21 Gastroesophageal reflux, K22 Other esophageal diseases, K25 Gastric ulcer, K26 Duodenal ulcer, K27 Peptic ulcer of unspecified localization, K28 Gastrojejunal ulcer, K29 Gastritis and duodenitis, K30 Dyspepsia

\*\* N10 Acute tubulointerstitial nephritis, N11 Chronic tubulointerstitial nephritis, N12 Tubulointerstitial nephritis unspecified

\*\*\* N30 Cystitis, N31 Neuromuscular urinary bladder dysfunction, N32 Other urinary bladder disorders, N34 Urethritis, N35 Urethral stricture, N36 Other urethral disorders, N39 Other urinary system disorders

\*\*\*\* Zagreb University Hospital Center, Sestre milosrdnice University Hospital, University Hospital for Tumors, University Hospital of Traumatology, Dubrava University Hospital, Merkur University Hospital, Jankomir Psychiatry Hospital, Vrapce Psychiatry Hospital, Special Hospital for Chronic Diseases

(N30–N39). The study included a total of 975 patients, 227 of whom initially hospitalized for pneumonia and 748 hospitalized for other specified diagnoses, which acted as a control group.

The data used in this study were obtained from hospitalization database kept for the City of Zagreb at the Zagreb Public Health Institute<sup>9</sup>. The data on all patients hospitalized at Zagreb hospitals during the current year are entered in the database by use of a legally regulated patient – statistical form. The form is filled-out on patient discharge from any inpatient health institution irrespective of its ownership. The data are linked to a particular person (first name, family name, citizen identification number), and are entered in the form irrespective of whether the patient is being discharged from the hospital for home care, transferred to another institution, or he/she died. A single form is filled-out for each hospitalization (transfer to another department of the same hospital is not considered hospital stay discontinuation, thus no new hospitalization form is filled-out)<sup>10</sup>. In the present study, the patient data (age and sex) and the following hospital stay data were investigated: date of admission, date of discharge, main diagnosis on discharge and cause of death in case of patient death. Regarding the data entry, some rules were respected: date of admission had to fall within the current or preceding year, whereas the total number of hospital days could not exceed 365; the date of discharge had to fall within the year examined for hospital morbidity; the codes of the International Classification of Diseases and Related Health Problems (ICD-X) were used in entering the main diagnosis for hospitalization; in case of death, the main cause was defined according

to ICD-X following World Health Organization regulations.

In this study the observational epidemiologic method free from any artificial manipulation with the study factor was used. A descriptive method of investigation was employed, including the presentation of the current state and all time-related disease variations observed (3-year disease pattern) as well as the individuals affected, e.g., age and sex<sup>11</sup>.

A statistical analysis of the work hypotheses was performed by use of nonparametric methods (mostly  $\chi^2$ -test) for variables expressed as categories (age groups). The hypotheses related to continuous variables (number of hospital days) were tested by the analysis of variance.

## Results

A total of 975 patients hospitalized in Zagreb hospitals were followed-up, including 227 (23.3%) patients initially hospitalized for pneumonia (group 1) and 748 (76.7%) patients initially hospitalized for other diagnoses (group 2).

In the course of the follow-up period, 30 patients were affected with and rehospitalized for pneumonia, including 22 group 1 patients (the group of patients initially hospitalized for pneumonia) and 8/748 group 2 patients (the group of patients initially hospitalized for other diseases), yielding a statistically significant between-group difference ( $\chi^2=34.780$ ,  $p<0.001$ ).

Sex analysis according to patient groups showed no statistically significant between-group difference, the patient sex distribution being quite uniform. In group 1,

TABLE 2  
TABLE OF CONTINGENCY – PATIENTS HOSPITALIZED FOR PNEUMONIA AND OTHER DIAGNOSES, AND REHOSPITALIZED FOR PNEUMONIA DURING THE 1998–2000 PERIOD ACCORDING TO AGE GROUPS, AND  $\chi^2$ -TEST RESULTS

Age (yrs)	Rehospitalization				Total
	PN <sup>d</sup>	PN-R <sup>e</sup>	CONT <sup>f</sup>	CONT-R <sup>g</sup>	
18–49	N <sup>a</sup>	28	2	208	239
	hp <sup>b</sup>	11.7%	0.8%	87.0%	100.0%
	vp <sup>c</sup>	13.7%	9.1%	28.1%	24.5%
50–64	N	51	5	189	245
	hp	20.8%	2.0%	77.1%	100.0%
	vp	24.9%	22.7%	25.5%	25.1%
65–84	N	113	15	322	456
	hp	24.8%	3.3%	70.6%	100.0%
	vp	55.1%	68.2%	43.5%	46.8%
85–99	N	13		21	35
	hp	37.1%		60.0%	100.0%
	vp	6.3%		2.8%	3.6%
Total	N	205	22	740	975
	hp	21.0%	2.3%	75.9%	100.0%
$\chi^2$ -test			$\chi^2=34.780$	df=9	$p<0.001$

<sup>a</sup>number of cases; <sup>b</sup>percentage relative to horizontal sum; <sup>c</sup>percentage relative to vertical sum; <sup>d</sup>group of pneumonia patients without rehospitalization; <sup>e</sup>group of pneumonia patients with rehospitalization; <sup>f</sup>group of other disease patients without rehospitalization; <sup>g</sup>group of other disease patients with rehospitalization

women accounted for 41.4% and men for 58.6%, whereas in group 2 the respective figures were 44.7% and 55.3%. In group 1, 59.1% of female and 40.9% of male patients were rehospitalized for pneumonia.

As the risk of pneumonia morbidity and mortality is age related, all patients from both groups were divided into the following age subgroups: 18–49, 50–64, 65–84 and 85–99 years (Table 1). The patients belonging to older age groups prevailed, with the exception of >85 age group, which accounted for 3.6% of the total number of study patients. The 65–84 age group prevailed (46.8%), followed by 50–64 age group (25.1%). The individuals aged 65–84 predominated in both study groups, accounting for 56.4% and 43.9% of group 1 and group 2 patients, respectively, followed by younger patients aged 18–49 (27.9%).

The analysis of age distribution of 22 PN group patients rehospitalized for pneumonia (PN-R subgroup) revealed the 65–84 age groups to prevail (N=15, 68.2%). In CONT group, eight patients required rehospitalization (CONT-R subgroup), six of them aged 65–84, accounting for 75.0% of all rehospitalizations recorded in CONT group. In PN-R subgroup, the 50–64 age group patients were the second most frequent in terms of rehospitalization rate (N=5, 22.7%). In this subgroup, there was no patient older than 85 requiring rehospitalization, whereas in the CONT-R subgroup one patient aged >85 and one patient from 18–49 age group were rehospitalized for pneumonia (Table 2).

In PN group (primary hospitalization for pneumonia), the mean age was 66.00 (range 18–94) years, and in PN-R subgroup (rehospitalization in PN group) 65.91 (range 38–81) years. In CONT group (primary hospitalization for other diagnoses), the patients were somewhat younger than those from PN group, the mean age being 59.26 (range 18–94) years, whereas the patients from the CONT-R subgroup (rehospitalization in CONT group) were the oldest, their mean age being 73.88 (range 40–94) years, which indicated that those hospitalized for other diagnoses were less frequently affected by the severe form of pneumonia requiring hospitalization in spite of their considerably older age (Table 3).

In the course of the 1998–2000 period, 161 patients from both study groups died, accounting for 16.5% of the total number of study subjects; there were 55 (34.2%) PN group (primary hospitalization for pneumonia) and 106 (65.8%) CONT group (primary hospitalization for other diagnoses) patients, yielding a statistically significant difference ( $\chi^2=40.368$ ,  $p<0.001$ ). Out of all deaths recorded during the study period, 20 (12.4%) were directly caused by pneumonia, and the rest of deaths were due to other causes. Out of 20 patients who died from pneumonia, ten were from PN group, and only one was from CONT group, the difference being statistically significant ( $\chi^2=15.82$ ,  $p<0.001$ ).

In group 1, 36 patients died from other diagnoses, accounting for 65.5%, whereas deaths due to pneumonia accounted for 34.5% of the total number of deaths in this group. In group 2, only one patient died from pneumonia and all other deaths were due to other causes, accounting for 0.9% and 99.1% of 106 deaths in this group (Table 4).

According to the sequence of hospital stay, the majority of deaths (N=152, 94.4%) occurred during initial hospitalization (Table 5). Out of these 152 deaths during initial hospitalization, 47 (29.2%) and 105 (65.2%) were

**TABLE 3A**  
PARAMETERS OF AGE DISTRIBUTION OF PATIENTS HOSPITALIZED FOR PNEUMONIA AND OTHER DISEASES, AND OF PATIENTS REHOSPITALIZED FOR PNEUMONIA DURING THE 1998–2000 PERIOD, AND TOTAL FIGURES

Patient group	N	Mean	SD	SE	95% Confidence interval of Mean		Range
					h <sub>1</sub>	h <sub>2</sub>	
PN <sup>a</sup>	205	66.00	14.86	1.04	63.96	68.05	18–94
PN-R <sup>b</sup>	22	65.91	11.99	2.56	60.59	71.23	38–81
CONT <sup>c</sup>	740	59.26	16.13	0.59	58.10	60.43	18–94
CONT-R <sup>d</sup>	8	73.88	16.16	5.71	60.36	87.39	40–92
Total	975	60.95	16.07	0.51	59.94	61.96	18–94

<sup>a</sup>group of pneumonia patients without rehospitalization; <sup>b</sup>group of pneumonia patients with rehospitalization; <sup>c</sup>group of other disease patients without rehospitalization; <sup>d</sup>group of other disease patients with rehospitalization; SD=standard deviation; SE=standard error

**TABLE 3B**  
ANALYSIS OF VARIANCE FOR AGE OF PATIENTS HOSPITALIZED FOR PNEUMONIA AND OTHER DISEASES, AND REHOSPITALIZED FOR PNEUMONIA DURING THE 1998–2000 PERIOD

Source of variability	Sum of Squares	df	Mean Square	F	p
Between groups	9220.896	3	3073.632	12.318	<0.001
Within groups	242286.308	971	249.522		
Total	251507.204	974			

**TABLE 4**  
TABLE OF CONTINGENCY – DEATHS IN PATIENTS HOSPITALIZED FOR PNEUMONIA AND OTHER DISEASES DURING 1998–2000 PERIOD ACCORDING TO DEATH DIAGNOSIS AND  $\chi^2$ -TEST RESULTS

Death diagnosis	Patient group			Total
		Pneumonia	Other diagnoses	
J12–18 <sup>d</sup>	N <sup>a</sup>	19	1	20
	hp <sup>b</sup>	95.0%	5.0%	100.0%
	vp <sup>c</sup>	34.5%	0.9%	12.4%
K20–31 <sup>e</sup>	N		7	7
	hp		100.0%	100.0%
	vp		6.6%	4.3%
N10–12 i 30–39 <sup>f</sup>	N		2	2
	hp		100.0%	100.0%
	vp		1.9%	1.2%
Other diagnoses	N	36	96	132
	hp	27.3%	72.7%	100.0%
	vp	65.5%	90.6%	82.0%
Total	N	55	106	161
	hp	34.2%	65.8%	100.0%
$\chi^2$ -test		$\chi^2=40.368$	df=3	p<0.001

<sup>a</sup>number of cases; <sup>b</sup>percentage of horizontal sum; <sup>c</sup>percentage of vertical sum; <sup>d</sup>pneumonia; <sup>e</sup>esophagogastroduodenal diseases; <sup>f</sup>pyelonephritis and other urinary tract diseases

**TABLE 5**  
TABLE OF CONTINGENCY – DEATHS IN PATIENTS HOSPITALIZED FOR PNEUMONIA AND OTHER DISEASES, AND REHOSPITALIZED FOR PNEUMONIA DURING 1998–2000 PERIOD ACCORDING TO DEATH DIAGNOSIS AND  $\chi^2$ -TEST RESULTS

Death diagnosis	Rehospitalization				Total	
		PN <sup>g</sup>	PN-R <sup>h</sup>	CONT <sup>i</sup>		CONT-R <sup>j</sup>
J12–18 <sup>d</sup>	N <sup>a</sup>	15	4		1	20
	hp <sup>b</sup>	75.0%	20.0%		5.0%	100.0%
	vp <sup>c</sup>	31.9%	50.0%		100.0%	12.4%
K20–31 <sup>e</sup>	N			7		7
	hp			100.0%		100.0%
	vp			6.7%		4.3%
N10–12 i 30–39 <sup>f</sup>	N			2		2
	hp			100.0%		100.0%
	vp			1.9%		1.2%
Other diagnoses	N	32	4	96		132
	hp	24.2%	3.0%	72.7%		100.0%
	vp	68.1%	50.0%	94.1%		82.0%
Total	N	47	8	105	1	161
	hp	29.2%	5.0%	65.2%	0.6%	100.0%
$\chi^2$ -test		$\chi^2=51.555$		df=9		p<0.001

<sup>a</sup>number of cases; <sup>b</sup>percentage of horizontal sum; <sup>c</sup>percentage of vertical sum; <sup>d</sup>pneumonia; <sup>e</sup>esophagogastroduodenal diseases; <sup>f</sup>pyelonephritis and other urinary tract diseases; <sup>g</sup>group of pneumonia patients without rehospitalization; <sup>h</sup>group of pneumonia patients with rehospitalization; <sup>i</sup>group of patients with other diseases without rehospitalization; <sup>j</sup>group of patients with other diseases with rehospitalization

due to pneumonia and other diagnoses, respectively. Nine patients died during rehospitalization, eight (5%) of them from PN group (PN-R subgroup) and only one (0.6%) from CONT group (CONT-R subgroup). The ma-

ajority of deaths due to pneumonia (N=15, 75.0%) occurred during the primary hospital stay. During rehospitalization, four PN (PN-R) patients and only one CONT (CONT-R) patient died from pneumonia.

**TABLE 6A**  
PARAMETERS OF AGE DISTRIBUTION OF PATIENTS DECEASED DURING THE 1998–2000 PERIOD ACCORDING TO DEATH DIAGNOSIS

Death diagnosis	N	Mean	SD	SE	95% Confidence interval of Mean		Range	
					h <sub>1</sub>	h <sub>2</sub>	Min	Max
J12–18 <sup>a</sup>	20	74.90	10.88	2.43	69.81	79.99	54	94
K20–31 <sup>b</sup>	7	70.00	7.79	2.94	62.80	77.20	61	80
N10–12 i 30–39 <sup>c</sup>	2	60.00	7.07	5.00	–3.53	123.53	55	65
Other diagnoses	132	69.11	11.93	1.04	67.06	71.17	26	94
Total	161	69.76	11.75	0.93	67.93	71.59	26	94

<sup>a</sup>pneumonia; <sup>b</sup>esophagogastroduodenal diseases; <sup>c</sup>pyelonephritis and other urinary system diseases; SD=standard deviation; SE=standard error

**TABLE 6B**  
ANALYSIS OF VARIANCE FOR AGE OF THE DECEASED DURING THE 1998–2000 PERIOD ACCORDING TO DEATH DIAGNOSIS

Source of variability	Sum of Squares	df	Mean Square	F	p
Between groups	774.46	3	258.152	1.903	0.131
Within groups	21302.10	157	135.682		
Total	22076.55	160			

The overall mean age of patients who died from all causes was 69.76 (range 26–94) years. Those who died from pneumonia were on an average older, their mean age being 74.90 (range 54–94) years (Table 6).

## Discussion

In Croatia and in the City of Zagreb, the proportion of individuals older than 65 is on an increase, entailing an ever growing burden of elderly population at the social, medical and health care level in general. Pneumonia is a common cause of morbidity and mortality in the elderly. The elderly are more frequently hospitalized for pneumonia, their hospital stay is longer and the treatment outcome poorer than in younger persons<sup>12</sup>. The higher rate of affection with particular diseases at an advanced age can be explained by chronic disease comorbidity. This is evident in pulmonary diseases, where pneumonia occurs more commonly due to the existing respiratory tract and lung lesions as well as the coexistence of congestive cardiac insufficiency<sup>13</sup>.

The pneumococcal vaccine provides an efficient protection of the individuals at risk, including the elderly, from invasive pneumococcal disease or bacteremia, although the data do not show the same efficacy of protection from pneumococcal pneumonia at an advanced age<sup>14–16</sup>. However, many authors agree that the protection from invasive pneumococcal disease provided by the vaccine justifies its use in the elderly and other groups at risk, the more so as pneumococcal pneumonia is a major cause of bacteremia<sup>5,17</sup>. A cost-effectiveness analysis carried out in the USA pointed to dual savings achieved by vaccination of the population aged over 65

for protection from pneumococcal bacteremia: their health improvement and direct cost reduction through the prevention the disease development. The analysis was based on health care model and QALY (quality-adjusted life year) index, comparing the price of a vaccine dose to the price of treatment for pneumococcal bacteremia<sup>18</sup>. Tengs *et al.* refer to vaccination of the elderly with pneumococcal vaccine as to one of the most cost-effective measures among 500 life-saving interventions undertaken for the sake of prolongation of life expectancy in the elderly<sup>19</sup>.

Some studies point to the public health, also implying an economically favorable effect of vaccination of the elderly following hospitalization for pneumonia<sup>20</sup>. In their study carried out in the USA, Fedson *et al.* demonstrated that 6% to 9% of elderly patients hospitalized for pneumonia would require rehospitalization for the same disease within the next 5 years. These results confirm the rationality of vaccination of the elderly following an inpatient treatment for pneumonia<sup>21</sup>.

The results of the present study also showed the risk of pneumonia recurrence and rehospitalization in the course of 3 years after primary hospitalization to be almost threefold with both pneumonia as the initial diagnosis and other diagnoses (ratio 22:8). The mean age of rehospitalized patients with the initial diagnosis of pneumonia was lower than the mean age of rehospitalized patients with other initial diagnoses (65.9 vs 73.9 years), in spite of the ratio being opposite on primary hospitalization. This finding suggests that those hospitalized for other diseases were less frequently affected with a severe form of pneumonia, which requires hospitalization, and even this only at a considerably older age. The mor-

tality directly due to pneumonia was also significantly higher in the group of patients with the initial diagnosis of pneumonia (34.5%) than in the group of patients with other initial diagnoses (0.9%). The patients who died from pneumonia were on an average older than the overall mean age at death from all causes (74.9 vs 69.8 years). Hedlund *et al.* demonstrated in their study of 573 patients hospitalized for pneumonia or other diagnoses that the risk of rehospitalization for pneumonia during the 3-year follow-up was nearly fivefold if the initial diagnosis had been pneumonia and that the mortal-

ity was also significantly higher, especially in those older than 50<sup>22</sup>. This appears to suggest the conclusion that a previous episode of inpatiently treated pneumonia is an important indicator of an increased risk of disease recurrence and death from pneumonia. As *Streptococcus pneumoniae* is the leading cause of pneumonia in the elderly, it is concluded that vaccination of this population group with pneumococcal vaccine following hospitalization for pneumonia would be a highly cost-effective method for prevention of pneumonia recurrence and rehospitalization.

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M. Polić-Vižintin

Zagreb Public Health Institute, Mirogojska c. 16, 10000 Zagreb, Croatia

## RIZIK PONOVRNOG OBOLJEVANJA OD PNEUMONIJE KOD BOLESNIKA PRETHODNO HOSPITALIZIRANIH ZBOG PNEUMONIJE – RETROSPEKTIVNO ISTRAŽIVANJE OD 1998. DO 2000. GODINE

### SAŽETAK

Iako je poznato da starijim hospitaliziranim bolesnicima (bez obzira na uzrok hospitalizacije) prijeti veći rizik da poslije obole od pneumonije, prema nekim istraživanjima taj je rizik još veći za osobe hospitalizirane zbog pneumonije nego za one koji su hospitalizirani zbog drugih bolesti. Cilj ovog rada je retrospektivnim istraživanjem pokušati utvrditi povezanost između boravka u bolnici zbog pneumonije i nekih drugih uzroka bolesti, s naknadnim morbiditetom, odnosno mortalitetom od pneumonije. Istraživali smo rizik od ponovnog oboljevanja od pneumonije za bolesnike već hospitalizirane zbog pneumonije. Pratili su se i usporedile ponovne hospitalizacije oboljelih od pneumonije, koji su jednom već bili hospitalizirani zbog te bolesti, s ponovnom hospitalizacijom bolesnika koji su u istom razdoblju bili hospitalizirani zbog drugih uzroka. Istraživani bolesnici bili su stariji od 18 godina, prvi put hospitalizirani tijekom 1998. godine zbog pneumonije (J12–J18), pojedinih gastrointestinalnih (K20–K31) i urogenitalnih bolesti (N10–N12, N30–N39). Tijekom tri godine pratili su se sve ponovne hospitalizacije zbog pneumonije u devet zagrebačkih bolnica. Od ukupno 975 osoba praćenih zbog ponovne hospitalizacije, 227 (23,3%) hospitalizirano je zbog pneumonije, a 748 (76,7%) zbog drugih dijagnoza. Tijekom tri godine je zbog pneumonije ponovno hospitalizirano 30 osoba, od kojih 22 bolesnika prvi put hospitaliziranih zbog pneumonije, što je statistički značajna razlika između praćenih skupina ( $\chi^2=34,780$ ;  $p<0,001$ ). Mortalitet izravno uzrokovan pneumonijom također je značajno viši u skupini s inicijalnom dijagnozom pneumonije nego u drugoj skupini ( $\chi^2=15,82$ ;  $p<0,001$ ).