Severity of postoperative pneumonia in thoracic surgery versus major abdominal surgery

A. Rodríguez-Fuster[1]; R.Chalela[2]; P.Sánchez-Velázquez[3]; L.Grande[3]; J.Gea[2]; J.Belda[1]
[1]Department of Thoracic Surgery; [2]Department of Respiratory Medicine; [3]Department of General and Digestive Surgery.
Hospital de Mar. Parc de Salut Mar. Barcelona/Spain.

Introduction

Postoperative pneumonia is consider as a nosocomial pneumonia. However it could have a different course according to the type of major surgery in surgical patients in contrast with patients without surgical intervention. Nowadays the management remains the same based on guidelines for nosocomial pneumonia. Its incidence ranges between 1,3% and 17,5%. Differences in clinical course could involve a different management.

Objective

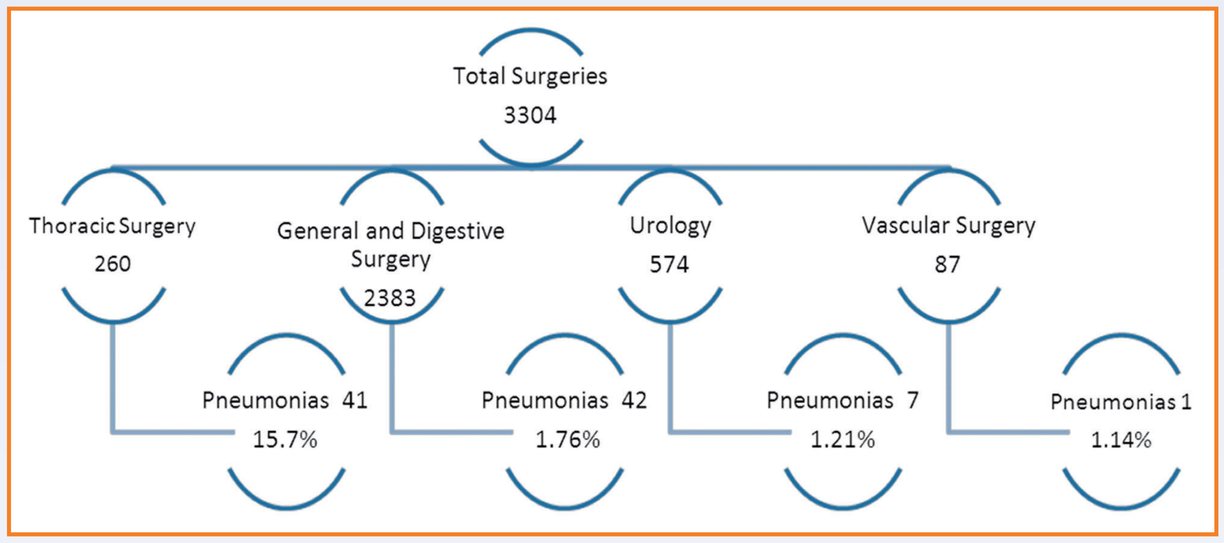
To compare the incidence, evolution, microbiological features and treatment of postoperative nosocomial pneumonia after elective open approach for lung resection versus major abdominal surgery. The hypothesis is that pneumonia in thoracic surgery has a worse course than abdominal surgery.

Methods and materials

We studied patients from thoracic, general, vascular, and urological surgery who developed postoperative pneumonia between 2008 and 2011. We excluded nosocomial pneumonia in medical patients or emergency surgical patients due to patient conditions before pneumonia are differents or they hadn't surgical aggression.

Results

There were not statistically significant differences in comorbidity between groups. There were more smokers (p<0.001) and a higher ASA scale (p<0.037) in thoracic group. The main procedures were the following: 33 lobectomies (80,5%) in thoracic group; 24 colorrectal (57,1%), 7 esophageal (16,7%), 6 gastric (14,3%), 4 hepatobiliary (9,5%), and 1 pancreatic (2,4%) resections in general group; 1 aortobifemoral bypass in vascular group; and 3 nephrectomies (42.85%), 2 prostatectomies (28.57%), and 2 cystectomies (28.57%) in urological group.
Postoperative bronchoscopy was significantly more used in thoracic group (58,5%) than in general (24,4%, p=0,002), vascular (0%), and urology (14,3%, p=0,032).
PaO2/FiO2 ratio was lower in thoracic group compared to general (178,7 vs. 241,9, p=0,03).
Empirical antibiotic treatment was as monotherapy (36,1%), double (56,6%) and triple therapy (7,2%).
From all deaths, Pseudomona was isolated in 50% and K. pneumonia in 35% cases whereas empirical monotherapy was administered in 64,3% and as double therapy in 35,7%. Thoracic surgery showed the highest mortality rate.



	Thoracic Surgery	Abdominal General Surgery	p	Vascular Surgery	Urology	p
Age	66,9±10,6	70,2±13,8	0.073	55	68,29±9,69	0,872
Gender (Man/Woman)	37 (90,2%) vs 4 (9,8%)	32 (76,2%) vs 10 (23,8%)	0,087	1 (100%) vs 0	7 (100%) vs 0	

Microbiology	**41 Pneumomias in Thoracic Surgery % Culture Positive**	**50 Pneumonias in Abdominal Surgery Group % Culture Positive**
Ps. Aeruginosa	41.4%	4%
S. Pneumoniae	21.95%	2%
H. Influenzae	19.51%	8%
K. Pneumoniae	24.39%	2%
S. Aureus	19.51%	10%
E. Coli	17%	0%
E. Cloacae	4.87%	4%
Funghi	24.39%	10%
Miscellania	24.39%	20%

		Risk Indexes					
		Thoracic Surgery	Abdominal General Surgery	p	Vascular Surgery	Urology	p
ASA		41 (100%)	42 (100%)	0,037	1 (100%)	7 (100%)	0,053
	I	0 (0%)	0 (0%)		0 (0%)	1 (14,3%)	
	II	5 (12,2%)	15 (35,7%)		1 (100%)	1 (14.3%)	
	III	31 (75,6%)	25 (59,5%)		0 (0%)	3 (42.9%)	
	IV	5 (12,2%)	2 (4,8%)		0 (0%)	2 (28.6%)	
Risk Index for postoperative pneumonia (Arozullah)		41 (100%)	42 (100%)	0,074	1 (100%)	7 (100%)	0,001
	1	0 (0%)	1 (2,4%)		0 (0%)	0 (0%)	
	2	3 (7,3%)	8 (19%)		1 (100%)	2 (28.6%)	
	3	29 (70,7%)	31 (73,8%)		0 (0%)	3 (42.9%)	
	4	9 (22%)	2 (4,8%)		0 (0%)	2 (28.6%)	
	5	0 (0%)	0 (0%)		0 (0%)	0 (0%)	

	Clinical Evolution					
	Thoracic Surgery	Abdominal General Surgery	p	Vascular Surgery	Urology	p
ICU	27 (65,9%)	11 (26,2%)	<0,001	0 (0%)	1 (14.3%)	0,016
Mechanical Ventilation	13 (31,7%)	5 (11,9%)	0,042	0 (0%)	1 (14.3%)	0,329
Good evolution	29 (70,7%)	40 (95,2%)	0,003	1 (100%)	7 (100%)	0.169
Mortality	12 (29,3%)	2 (4,8%)	0,003	0 (0%)	0 (0%)	
Mortality due to pneumonia	10 (24,4%)	1 (2,4%)	0,003	0 (0%)	0 (0%)	
Patients with other postoperative complications associated to pneumonia	28 (68,3)	21 (50%)	0,09	0 (0%)	0 (0%)	
Mortality due to other causes	2 (4,9%)	1 (2,4%)		0 (0%)	0 (0%)	

Conclusions

Incidence and severity of postoperative pneumonia are higher in thoracic surgery. Our diagnostic management is more aggressive in thoracic patients. *Ps. aeruginosa* is one of the main and more aggressive pathogens responsible for pneumonia in thoracic surgery in our hospital. We should consider a more accurate and aggressive medical management in thoracic surgery patients after diagnosis of postoperative pneumonia.

Hospital del Mar
Parc de Salut MAR Barcelona