POSTOPERATIVE PULMONARY INFECTION. PECULIARITIES IN PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY

SILVIUS NEGOIȚĂ[1], CORINA SOARE[2], MIHAI POPESCU[3], DAN CORNECI[4]

[1,2,4]Elias Emergency University Hospital Bucharest, [3]Emergency University Hospital, Piteşti

Keywords: *major abdominal surgery, ventilator associated pneumonia (VAP), empiric antibiotherapy, carbapenem*

Abstract: *Nosocomial pneumonia is the second most common infectious disease in hospitalized patients. VAP is defined as a pulmonary infection developed after at least 48 hours of mechanical ventilation in patients with no evidence of pre-existing lung infectious injuries. VAP is diagnosed in almost a quarter of the intensive care unit (ICU) patients. We performed an observational retrospective study in 58 adult patients undergoing major surgical procedures who developed post-operative pulmonary infection and in some cases surgical complications, requiring admission in the ICU. An increased percent of these patients, 79.31%, were mechanically ventilated. Judging by the frequency of the etiologic agents encountered, Acinetobacter baumani, Pseudomonas aeruginosa and Methicillin-resistant Staphylococcus aureus (MRSA) were the most common. Acinetobacter baumani was responsible for 66.66% of the cases. First choice empiric antibiotic therapy was represented by carbapenems, PIP/TAZ and amino glycosides, taking into account the local flora spectrum of resistance. Length of stay (LOS) in the ICU was between 4 and 37 days (mean 12.5 days), without significant differences in survivors and no survivors. Overall mortality was 75.86% with a VAP associated mortality of 13.79%.*

INTRODUCTION

Nosocomial pneumonia is the second most common infection in hospitalized patients.(1) VAP is defined as a pulmonary infection that develops after at least 48 hours of mechanical ventilation in patients with no evidence of lung infectious injury.(2) It represents the leading cause of mortality, morbidity and increased LOS (length of stay) in the Intensive Care Unit (ICU) and prolonged mechanical ventilation in critically ill patients. Early onset VAP is defined as pneumonia with onset after 48hours after intubation but in the first 5 days.(2) VAP is diagnosed at 8 to 20% of ICU patients and up to 27% of those mechanically ventilated. Mortality rate ranges from 20 to 50% and sometimes 70%.VAP is thought to increase mortality of the underlying disease by 30%. There is a incremental risk of VAP of about 1-3% per day of ventilation.(3)

Empiric antibiotic therapy chosen for the treatment of nosocomial pneumonia and/or VAP in surgical patients is influenced by the antibiotic regimen of the patient prior to hospitalisation (spectrum of resistance) but especially by the type of admission in the ICU (trauma, surgical or non surgical).(4) The most prescribed antibiotics were carbapenems, PIP/TAZ and quinolones. In 50% of the cases, the first two were prescribed in association.(5)

METHODS

The retrospective observational study we conducted in Elias ICU included 58 patients ASA II-ASA IV (74.13% of them admitted postoperative, in emergency) diagnosed with hospital acquired pneumonia, aged 7.21-72.2 years (male vs. female), hospitalised between April 2011 – April 2013. Patients with preoperative infectious pulmonary disease and preexisting severe pulmonary disease were excluded from the study. The most frequent types of surgical pathologies were: non malignant bowel obstruction syndrome (n=22, 37.39%), billiary tract pathology (n=13, 22.41%) and colorectal cancer (n=10, 17.24%). VAP was diagnosed following CDC criteria (Center for Disease Control and Prevention).(6) For each patient we recorded: temperature, leukocytes count, tracheal secretions, oxygenation – PaO2/FiO2 ratio (clinical pulmonary infection score - CPIS score).

As objectives, our study aimed at determining: hospital-acquired pneumonia (HAP) morbidity and microbial agents involved, VAP incidence and the correlation to the length of mechanical ventilation, antibioterapy and patients evolution.

RESULTS

In our study, we included 58 patients (60.34% male), admitted in the ICU after major abdominal surgical procedures, who developed severe pulmonary infections. An important percent (81.03%, 47 patients) required oro-tracheal intubation between the day of the surgery and the 20th day postoperative. VAP was diagnosed in 9 patients, with an incidence of 19.65% in the intubated group.

The comorbidities incidence was high in the case of sever systemic disease (79.31%, n=46) and in equal percentage (24.13%, n=14) for neoplasia and diabetes mellitus, correlating the comorbidities frequency of appearance with VAP frequency and VAP mortality (0.9866). In 21 cases (36.2%) reintervention was performed in the first two weeks after initial surgery. Only 4 of these patients survived. High mortality post reintervention (29.31%) requires further studies, including larger groups, for separating the pulmonary and surgical causes that lead to death. The most frequent reintervention diagnosis was: fistula, obstructive bowel syndrome, evisceration and abdominal compartment syndrome.

VAP onset is between day 3 and 7 of mechanical ventilation, early onset VAP being diagnosed in 8 patients. VAP

[1]Corresponding author: Silvius Negoiţă, B-dul Mărăşti, Nr. 17, Cod 011461, Sector 1 Bucureşti, România, E-mail: silviusneg@gmail.com, Phone: +4021 3161600

Article received on 09.11.2014 and accepted for publication on 15.12.2014
ACTA MEDICA TRANSILVANICA March 2015;20(1):102-103

associated morbidity was 88.88% (n=8) with a mortality rate of 13,79%, exitus occurring after 4.375 days after the diagnosis.

A total number of 14 patients survived and were discharged from the ICU between day 4 and 37 postoperative. (mean LOS 12.508 days). In 31.03% (n=18) despite the fact that CPIS score was suggestive for pulmonary infection, tracheal cultures were negative. Mortality was 61.11% (n=7) in these patients, probably by surgical causes. Due to technical difficulties, BAL could not be performed. Judging by the frequency of the etiologic agents encountered, Acinetobacter baumani (31.03%, n=18), Pseudomonas aeruginosa (12.06%, n=7) and MRSA (6.89%, n=4) were the most common. In VAP patients, Acinetobacter was identified in half of the cases, twice as much as Pseudomonas and MRSA, which were found in an equal number of cases. First choice empiric antibiotic therapy was with carbapenems (65.51%, n=38), PIP/TAZ (25.86%,n=15) and aminoglicosides (22.41%,n=13), correlating with the number of patients with VAP (0,9825). In 44.82% of these cases, patients received monotherapy with PIP/TAZ or carbapenems. From all patients, the group treated empiric with carbapenems had a significantly higher incidence of VAP, compared to the group receiving aminoglicosides (21.05% vs. 7.69%). In survivors, PIP/TAZ and carbapenems were used in an equal number of cases in monotherapy or combined with colistin and aminoglicosides. (50%, n=7).

CONCLUSIONS

HAP mortality in patients with major abdominal surgery was 75.86%, with a VAP incidence of 19.65% in ICU patients. Length of mechanical ventilation prior to VAP diagnosis was 5.37 days, comparable with the literature (7.7 +/- 7.9, mean 5 days).(4)

The most common infectious agents involved in HAP and VAP were Acinetobacter baumani, Pseudomonas aeruginosa and MRSA. Acinetobacter was responsible for 66.66% of the cases with VAP.(>10%).(6)

The most prescribed antibiotic regimens in our study were carbapenems (65.51%) not PIP/TAZ (local increased resistance) which is the most prescribed antibiotic in surgical patient, as seen in EU VAP/CAP study group.

REFERENCES

1. Cunha BA. Pneumonia Essentials. 2nd ed. Royal Oak, Michigan: Physicians Press; 2008.
2. American Thoracic Society, Infectious Disease Society of America. Guidelines for the management of adults and hospital acquired, ventilator-associated and health care associated pneumonia. Am J Respir Crit Care Med. 2005;171:388-416.
3. Rea-Neto A, Nazah Y, Tuche F, Brunkhorst F, Ranieri M, Reinhart K, Sakr Y. Diagnosis of ventilator-associated pneumonia: a systematic review of the Literature. Critical Care. 2008, 12:R56 doi:10.1186/cc6877.
4. Rello J, Paiva AJ, Baraibar J et al. International Conference for the Development of Consensus on the Diagnosis and Treatment of Ventilator-associated Pneumonia, Chest. 2001;120:955,970.
5. Ulldemolins M, Lisboa T, Rello J, Manez R, De Waele JJ, Deja M, Diaz E and the EU-VAP/CAP study group. Determinants of prescription and choice of empirical therapy for hospital- acquired pneumonia and ventilator –associated pneumonia. Eu Resp J. 2011;37:1332 1339.
6. July 2013 CDC/NHSN Protocol Clarifications http://www.cdc.gov/nhsn/pdfs/pscmanual/6pscvapcurrent.pdf.
7. Masterton R, Craven D, Rello J, et al. Hospital-acquired pneumonia guidelines in Europe: a review of their status and future development. J Antimicrob Chemother. 2007;60:206-213.