Preliminary results of an antimicrobial stewardship intervention on community-acquired pneumonia in a teaching hospital

Pilar Retamar Gentil*[1], María Macías[1], Rita Criado[1], Isabel Morales[2], Fernando Oltra[1], Enrique Peral[1], Manuel León[3], Patricia Guerrero[1], Nínive Batista[3], Jesús Rodríguez-Baño[4]

[1]Hospital Universitario Virgen Macarena , Seville, Spain

[2]Hospital Universitario Virgen Macarena, Enfermedades Infecciosas, Microbiología Y Medicina Preventiva,.., Seville, Spain

[3]Hospital Universitario Virgen Macarena , Sevilla, Spain

[4]Hospital Universitario Virgen Macarena Y Virgen del Rocío, Universidad de Sevilla, Enfermedades Infecciosas, Microbiología Y Medicina Preventiva, Seville, Spain

Background: Community-acquired pneumonia (CAP) is, after urinary tract infection, the most frequent infectious disease syndrome in patients admitted to hospitals. Adherence to certain quality indicators (QI) related to CAP management is associated with best clinical, ecological and cost results. The aim of this study is to evaluate the impact of a non-compulsory, structured antimicrobial stewardship intervention focused on CAP management in a teaching hospital.

Material/methods: A quasiexperiemental, before-after an intervention study including all adult patients admitted with CAP to a 900-bed teaching hospital between October 2013 to August 2014 (pre-intervention cohort) and between October 2014 to August 2015 (intervention cohort) was performed. The intervention consisted on: educational targeted sessions on the updated local guidelines and advisory audits of management of patients with CAP on 1rst, 3rd and 5-7th day after admission, including the following QI: (1) assessment of risk estimation; (2) empiric and targeted treatments according to local guideline; (3) microbiological samples collection before antibiotic treatment (AT); (4) switching AT to oral and discharge; and (5) appropriate duration of AT. Infectious Diseases consultation for complex cases was suggested. Pre and post-intervention cohorts were compared for clinical features, epidemiology and prognosis (length of stay [LOS], 30-day mortality and 90-day readmission rate) and adherence to the QI using chi squared test and Mann-Whitney U test.

Results: 255 patients were included in the pre-intervention cohort and 244 in the intervention one. Comparative analysis of clinical, epidemiology, therapeutics and prognosis features between cohorts are shown in Table 1. Comparison of CAP QI compliance between cohorts in shown in Figure 1. The rate of adherence to QI was statistically higher in the intervention cohort in all the indicators registered.

Conclusions: A non-compulsory intervention based on QI indicators was effective to improve CAP management. The rate of readmissions, LOS and duration of intravenous AT were significantly shorter in the intervention cohort, without affecting 30-day mortality.

Table 1.

Factor	Pre-intervention N=255 % (no.)	Post-intervention N =244 % (no.)	p

Male	63 (160)	54 (130)	0.05
Age (median, IQR)	78 (69-85)	78 (67-89)	NS
PSI index (median, IQR)	3 (2-3)	3 (1-3)	NS
Charlson index (median, IQR)	1 (0-2)	2 (0-3)	NS
Combination therapy (total)	49 (124)	35 (86)	0.04
Days of IV AT (median, IQR)	6 (4-8)	4 (2-6)	0.003
Total AT duration (median, IQR)	11 (8-14)	9 (7-11)	NS
Lenght of stay (average, SD)	8.7 (5.1)	6.9 (4,4)	0.02
30-day mortality	4 (9)	5 (12)	0.5
90-day readmission	23 (58)	10 (24)	0.001

Fig 1.

Rate of QI compliance

AT ≤7days — Intervention 47, Pre-intervention 23
Oral switching — Intervention 60, Pre-intervention 19
Adequate empiric AT — Intervention 86, Pre-intervention 59
Samples taken — Intervention 92, Pre-intervention 42
Risk estimation — Intervention 55, Pre-intervention 20

Intervention (N=244)
Pre-intervention (N=255)