

molecular methods such as pulsed field electrophoresis, multiple-locus variable-number tandem repeat analysis, and whole-genome sequencing.

Following studies in the United States (U.S.), one *Salmonella* isolate case in a culture may represent 38.6 cases in the community.⁹ In the period 2012–2014, Spain reported an annual mean of 5600 cases of *Salmonella*² and following this estimation more than 200,000 cases could have occurred; indeed Spain is already the European country with the second highest rates of *Salmonella* infections.¹⁰ When we consider that most *Salmonella* infections are transmitted by foods, the implementation of a specific surveillance by a foodborne diseases network such as those in the U.S. and other countries could usefully to increase detection, control, and prevention of *Salmonella* and other etiologic agents of FO.⁹

References

1. Ballesté-Delpierre C, Vila-Estapé J. Why are we still detecting food-related *Salmonella* outbreaks in Spain. *Enferm Infecc Microbiol Clin.* 2016;34:541–3.
2. Centro Nacional de Epidemiología. <http://www.isciii.es/ISCIII/es/contenidos/fd-el-instituto/publicaciones.shtml>. Web visited December 4. Resultados de la vigilancia epidemiológica de las enfermedades transmisibles e Informes del sistema de información microbiológica. Años 2012, 2013, 2014. Madrid: Instituto de Salud Carlos III. Ministerio de Economía, Industria y Competitividad; 2016.
3. Bances M, Herrero A, González Y, Rodicio MR, González-Hevia MA. Brote de gastroenteritis en una guardería causado por una cepa de *Salmonella enterica* serovar Typhimurium portadora del plásmido híbrido de resistencia-virulencia pUO-StVR2. *Enferm Infecc Microbiol Clin.* 2007;25:376–81.
4. Arnedo-Pena A, Sabater-Vidal S, Herrera-León S, Bellido-Blasco JB, Silvestre-Silvestre E, Meseguer-Ferrer N, et al. An outbreak of monophasic and biphasic *Salmonella* Typhimurium and *Salmonella* Derby associated with the consumption of dried pork sausage in Castellon (Spain). *Enferm Infecc Microbiol Clin.* 2016;34:544–50.
5. Hernández-Arricibita E, Santamaria-Zuazua R, Ramos-López G, Herrera-León S, Kárkamo-Zuñeda JA, Agirre NM. Brote de infecciones por *Salmonella enterica*

serovar Typhimurium asociado al consumo de chorizo en Bizkaia. *Enferm Infecc Microbiol Clin.* 2016;34:577–8.

6. Echeita MA, Aladueña A, Cruchaga S, Usera MA. Emergence and spread of an atypical *Salmonella enterica* subsp *enterica* serotype 4,5,12:i:-, strain in Spain. *J Clin Microbiol.* 1999;37:3425.
7. Vico JP, Rol I, Garrido V, San Román B, Grilló MJ, Mainer-Jaime RC. Salmonellosis in finishing pigs in Spain. Prevalence, antimicrobial agent susceptibilities, and risk factor analysis. *J Food Prot.* 2011;74:1070–8.
8. Bellido-Blasco JB, González-Cano JM, Galiano-Arlandis JV, Herrero-Carot C, Tirado-Balaguer MD, Arnedo-Pena A, et al. Factores de riesgo de los casos esporádicos de diarrea por *Campylobacter*, *Salmonella* y rotavirus en niños preescolares. *An Pediatr.* 2007;66:367–74.
9. Voetsch AC, Van Gilder TJ, Angulo FJ, Farley MM, Shallow S, Marcus R, et al. FoodNet estimate of the burden of illness caused by nontyphoidal *Salmonella* infections in the United States. *Clin Infect Dis.* 2004;38 Suppl. 3:S127–34.
10. Molbak K, Simonsen J, Jorgensen CS, Krogfelt KA, Falkenhorst G, Ethelberg S, et al. Seroincidence of human infections with nontyphoid *Salmonella* compared with data from public health surveillance and food animals in 13 European countries. *Clin Infect Dis.* 2014;59:1599–606.

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Antimicrobial therapy in septic patients in Emergency units: Right from the outset[☆]



Tratamiento antibiótico de los pacientes con sepsis en los servicios de urgencias: acertar desde el principio

Dear Editor,

We have read the manuscript published by González del Castillo et al.¹ with interest and would like to make a few comments. This was a retrospective study that evaluated the impact of appropriate antimicrobial therapy on hospital stay and mortality in patients attending the Emergency Unit due to an infection. It concluded that inappropriate antimicrobial therapy prolongs the hospital stay but does not increase mortality. The small number of severely ill patients (only 1.1% had septic shock) may perhaps explain why there is no correlation between inappropriate treatment and mortality. It is also striking that mortality was lower in patients prescribed an inappropriate treatment, although this difference was not significant due to the small sample size (4.8% vs 12.6%).

The impact on prognosis of the early administration of antimicrobial therapy to sepsis patients in Emergency Units has also been questioned by other authors.² However, there is a vast array of

evidence supporting the need to initiate appropriate treatment early in sepsis patients.^{3,4}

Some years ago, we conducted a prospective study in patients admitted to the ICU with sepsis. The primary conclusion was that the administration of appropriate empirical antimicrobial therapy before admittance to the ICU was a protective factor for mortality.⁴ We have re-analysed our data to ascertain the impact of appropriate treatment in patients referred from the Emergency Unit. 421 patients were enrolled (median age 63 years). The most common foci were: abdomen (39.5%), lung (22.8%), skin and soft tissue (13.7%) and urinary system (12.8%). The multivariate analysis found appropriate treatment administered in the Emergency Unit to be a protective factor for hospital mortality: odds ratio (OR) of 0.26; 95% confidence interval: 0.15–0.45; $p < 0.001$.

Sepsis and septic shock account for a growing number of ICU admissions in Spain.⁵ Despite the fact that more and more elderly patients and patients with debilitating diseases are being admitted, a significant decrease in sepsis-related mortality has been seen in recent years.^{5–7} The early care of patients with sepsis is key to reducing its high mortality. Emergency Units are known to be extremely busy, which makes identifying certain sepsis patients particularly challenging.^{8,9}

For this reason, we feel the results from González del Castillo et al. should be interpreted with caution. Having said that, we do of course agree with the authors regarding the need to improve knowledge on sepsis management and the quality of antibiotic prescribing throughout the healthcare system, particularly in Emergency Units.¹⁰ In doing so, we will help to increase appropriate antimicrobial therapy and reduce sepsis-related mortality.

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References

- González-del Castillo J, Domínguez-Bernal C, Gutiérrez-Martín MC, Núñez-Orantos MJ, Candel FJ, Martín-Sánchez FJ. Efecto de la inadecuación de la antibioterapia en Urgencias sobre la eficiencia en la hospitalización. *Enferm Infecc Microbiol Clin.* 2017;**35**:2018–213.
- Vilella AL, Seifert CF. Timing and appropriateness of initial antibiotic therapy in newly presenting septic patients. *Am J Emerg Med.* 2014;**32**:7–13.
- Ferrer R, Martin-Loeches I, Phillips G, Osborn TM, Townsend S, Dellinger RP, et al. Empiric antibiotic treatment reduces mortality in severe sepsis and septic shock from the first hour: results from a guideline-based performance improvement program. *Crit Care Med.* 2014;**42**:1749–55.
- Garnacho-Montero J, Gutiérrez-Pizarra A, Escoreca-Ortega A, Fernández-Delgado E, López-Sánchez JM. Adequate antibiotic therapy prior to ICU admission in patients with severe sepsis and septic shock reduces hospital mortality. *Crit Care.* 2015;**19**:302.
- Azkárate I, Choperena G, Salas E, Sebastián R, Lara G, Elósegui I, et al. Epidemiología y factores pronósticos de la sepsis grave/shock séptico. Seis años de evolución. *Med Intensiva.* 2016;**40**:18–25.
- Vallés J, Palomar M, Álvarez-Lerma F, Rello J, Blanco A, Garnacho-Montero J, et al., GTEI/SEMICYUC Working Group on Bacteremia. Evolution over a 15-year period of clinical characteristics and outcomes of critically ill patients with community-acquired bacteremia. *Crit Care Med.* 2013;**41**:76–83.
- Sánchez B, Ferrer R, Suarez D, Romay E, Piacentini E, Gomà G, et al., Edusepsis Study Group. Declining mortality due to severe sepsis and septic shock in Spanish intensive care units: a two-cohort study in 2005 and 2011. *Med Intensiva.* 2017;**41**:28–37.
- Fernandez R, Clinical Management Working Group of the Societat Catalana de Medicina Intensiva i Crítica. Ocupación de los Servicios de Medicina Intensiva de Catalunya: un estudio analítico prospectivo de cohortes. *Med Intensiva.* 2015;**39**:537–42.
- Sundén-Cullberg J, Rylance R, Svefors J, Norrby-Teglund A, Björk J, Inghammar M. Fever in the emergency department predicts survival of patients with severe sepsis and septic shock admitted to the ICU. *Crit Care Med.* 2017;**45**:591–9.
- Miró O. El reto de la enfermedad infecciosa en los servicios de urgencias: a propósito de 3 estudios. *Enferm Infecc Microbiol Clin.* 2017;**35**:205–7.

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Consequences of inappropriate empirical antibiotic therapy depending on the patient's clinical situation*



Las consecuencias de la terapia antibiótica empírica inapropiada en función de la situación clínica del paciente

Dear Editor,

We have carefully read the comments made by Gutiérrez-Pizarra et al.¹ and we agree with the statements made in relation to the importance of the appropriateness of antibiotic treatment administered to critical patients in the emergency department. A great many scientific studies may be found in the literature which corroborate this statement.² What is notable here is that the studies published essentially focus on patients who present with septic shock or severe sepsis.² Since this issue has already been contrasted in the literature, our study design was different.

Our study is innovative³ in that it was conducted on patients who were not so seriously ill, which is a more realistic approximation of events in standard clinical practice in an emergency department (ED) where the infected patient is not usually critically ill. Our sample included patients who required hospitalisation, but did not necessarily present with a severe clinical condition. The number of patients included in our study with severe sepsis or septic shock is small, 54 (14.4%) patients, and among them inappropriate antibiotic treatment was administered to just 9 (16.7%).

This sample design justifies the results found in our study which show that in patient groups without severe conditions, inappropriate treatment will significantly increase hospital stay, leading to increased costs,⁴ but not to an increase in mortality.

When selecting our empirical prescription we have to mainly take into consideration the following 4 factors: probable microbial aetiology (depending on the infection model, local epidemiology and the patient profile), patterns of sensitivity and local resistance, pharmacokinetic characteristics and pharmacodynamics of the possible antimicrobial agents to be used and the consequences in prognostic terms of possible inappropriateness of the antibiotic on our patient.^{5–7}

Due to the fact that initial inappropriate anti-biotherapy conditions an increase in mortality in severe patients,² international guidelines recommend wide-spectrum antimicrobial agents for this patient profile.⁸ However, the consequences do not appear to be the same in non-critical patients. It is important to know this to develop appropriate anti-biotherapy policies, avoiding the unnecessary prescription of wide-spectrum antimicrobials, which could lead to an increase in the prevalence of resistant strains in our environment.⁷

To conclude, we agree that inappropriate treatment may condition an increase in mortality in the critically ill patient, but that this is not comparable with less serious situations where decision making about the choice of antibiotic treatment may not be of such clinical significance. The problem, on many occasions, is suitable stratification of the gravity of the patient's condition, particularly in populations which are increasingly attended by the ED, as is the case for immune-depressed patients undergoing biological treatments or elderly people where appropriate stratification is more complicated.^{9,6}

References

- Gutiérrez-Pizarra A, Garnacho-Montero J. Tratamiento antibiótico de los pacientes con sepsis en los Servicios de Urgencias: acertar desde el principio. *Enferm Infecc Microbiol Clin.* 2017;**35**:461–2.
- Marquet K, Liesenborgs A, Bergs J, Vleugels A, Claes N. Incidence and outcome of inappropriate in-hospital empiric antibiotics for severe infection: a systematic review and meta-analysis. *Crit Care.* 2015;**19**:63.
- González-Del Castillo J, Domínguez-Bernal C, Gutiérrez-Martín MC, Núñez-Orantos MJ, Candel FJ, Martín-Sánchez FJ. Effect of the inadequacy of antibiotic therapy in the Emergency Department on hospital stays. *Enferm Infecc Microbiol Clin.* 2017;**35**:208–13.
- Grau S. Main variables in the economic cost of treating an infection. *Enferm Infecc Microbiol Clin.* 2017;**35**:S41–5.
- Monclús Cols E, Capdevila Reniu A, Roedberg Ramos D, Pujol Fontrodona G, Ortega Romero M. Management of severe sepsis and septic shock in a tertiary care urban

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