

BRIEF REPORT

Factors associated with emergency department revisits for acute bacterial prostatitis

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Objective. To analyze factors associated with revisits by patients with acute bacterial prostatitis treated in a hospital emergency department.

Methods. Descriptive analysis and prospective follow-up of a cohort of patients with acute bacterial prostatitis treated in an emergency department.

Results. We included 241 episodes of acute bacterial prostatitis. The mean (SD) age was 63 (16) years. Seventy-three percent reported dysuria, 64% had fever, and between 15.4% and 22.4% had medical histories of cancer, urethral/bladder catheterization, or prostate adenoma. Positive urine cultures were obtained for 48.1% and positive blood cultures for 17.6%. *Escherichia coli* was the bacterium isolated most often, and 27.7% of the cultures showed resistance to ciprofloxacin and amoxicillin-clavulanic acid. Twenty-nine patients (12%) revisited within 30 days. The only factors associated with revisiting were performance of a rectal examination (odds ratio [OR], 9.23; 95% CI, 1.12–75.82) and bacteremia (OR, 3.81; 95% CI, 1.31–11.04) ($P < .05$).

Conclusion. Factors associated with revisiting for acute bacterial prostatitis were bacteremia and performance of a rectal examination.

Keywords: Acute bacterial prostatitis. Emergency department. Bacteremia. Rectal examination. Emergency department revisits.

Factores asociados a la reconsulta en urgencias en la prostatitis aguda bacteriana

Objetivo. Analizar los factores asociados a la reconsulta del paciente con prostatitis aguda bacteriana (PAB) atendido en el servicio de urgencias hospitalario (SUH).

Método. Estudio analítico de cohorte observacional con seguimiento prospectivo de las PAB atendidas en el SUH durante un año.

Resultados. Se registraron 241 episodios de PAB. La edad media fue de 63 (DE: 16) años. Presentaron disuria el 73%, fiebre el 64% y antecedentes de cáncer, manipulación previa de la vía urinaria o adenoma prostático entre el 15,4-22,4%. El 48,1% de los urocultivos y el 17,6% de los hemocultivos resultaron positivos. *Escherichia coli* fue el aislamiento mayoritario, presentando con resistencias en el 27,7% a ciprofloxacino y amoxicilina/clavulánico. A los 30 días reconsultaron 29 pacientes (12%). El tacto rectal, con *odds ratio* (OR) 9,23 (IC 95%: 1,12-75,82), y la bacteriemia, con OR de 3,81 (IC 95%: 1,31-11,04), fueron las únicas variables asociadas a la reconsulta ($p < 0,05$).

Conclusiones. Los factores relacionados con la reconsulta del enfermo con PBA fueron la presencia de bacteriemia y el tacto rectal.

Palabras clave: Prostatitis aguda bacteriana. Urgencias. Bacteriemia. Tacto rectal. Reconsulta.

Introduction

According to the National Institutes of Health (NIH) classification, acute bacterial prostatitis (ABP) is characterized by fever, perineal and/or suprapubic pain, clinical voiding, and signs of urinary infection¹. The ABP is an especially common entity, it is the most common parenchymal urinary infection in men and accounts for 6.6% of urinary tract infections in the Spanish hospital emergency services (HES)²⁻⁴. ABP has a broad clinical spectrum from mild to severe forms of sepsis^{5,6}. Mostly, after their evaluation in the HES, the patients with ABP

are sent home for ambulatory follow-up. This study shows the characteristics of the episodes of ABP treated in our center and the factors related to the repeated visits are specifically analysed.

Method

Observational, cohort study with a 30-day prospective follow-up of all cases diagnosed with ABP treated in the HES of a university and tertiary hospital between January and December 2012. Data on age, pathological

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history, pathology urinary symptoms, blood count, renal function, microbiology, antibiotic susceptibility, treatment and revisit. In the evaluation of the urincultures we have considered as significant bacteriuria the presence of $\geq 10^5$ UFC/ml or a recount $> 10^4$ UFC/ml with > 40 leucocytes/ μ L. The isolation of 2 or more microorganisms has been assessed as contamination.

The main endpoint of the study was the revisit at 30 days after the visit in the HES. For the description of the qualitative variables we used absolute and relative frequencies and for the quantitative ones the mean with standard deviation (SD). For the comparisons, the chi-square test was used for the first (or in the tables 2×2 the exact Fisher test when the expected numbers were less than 5) and the Student t-test for independent measurements for the second ones. The variables that were significant in the univariate analysis were introduced into a logistic regression model to fit the differences found in the 30-day ED revisit. For these models, odds ratios (OR) were calculated with their 95% confidence interval (CI). It was accepted that the differences were statistically significant if $p < 0.05$, or when the 95% CI of the OR excluded the value 1. The statistical program used was SPSS 19.0.

The manuscript has been reviewed by the Clinical Research Ethics Committee of the University Hospital of Bellvitge which considered the exemption of informed consent due to the observational nature of the project. Patient data were managed in a coded way according to the current legal regulations.

Results

During the study period, 241 episodes were recorded. The mean age was 63 years (SD: 16). There was a history of neoplasia, bladder catheterization/manipulation of the urinary tract or prostatic hypertrophy in 15.4%, 16.6% and 22.4%, respectively. The duration of symptoms was 3.4 days (SD: 4), there was voiding syndrome in 176 cases (73%) and fever in 154 (63.9%). At the time of the HES visit, 50 patients (20.7%) were on antibiotic treatment with an average of 3.8 days (SD: 2.64) and 36 (15%) had taken antibiotics in the previous month.

After the evaluation in the HES, the treatments were mainly amoxicillin/clavulanic (58.1%), ciprofloxacin (28.6%) and cephalosporins (5.4%). 216 urincultures were performed, of which 104 (48.1%) were positive and 24 (11.1%) were polymicrobial/contaminated. The presence of bacteraemia was detected in 24 of 136 blood cultures (17.6%). *Escherichia coli* was the most frequent isolate, with resistance to both ciprofloxacin and amoxicillin/clavulanic in 27.7%, cotrimoxazole in 22.9% and carried strains of extended spectrum beta-lactamase (ESBL) 10.8%. According to the sensitivity data, empirical antibiotic therapy was inadequate in 18 patients (15.5%). In the 30-day follow-up, 29 patients (12%) came to consultation again in the HES due to persistent urinary symptoms (12 cases), fever (10),

functional weakness-loss (5) and urinary retention (2). Twelve patients (41.4%) had an early recovery within 48 hours after discharge. In the univariate analysis, the only factors associated with the reconstitution were the rectal examination and the existence of bacteraemia (Table 1). Both variables maintained statistical significance in the multivariate analysis with an OR 9.23 (95% CI: 1.12-75.82) and 3.81 (95% CI: 1.31 11.04), respectively. Considering bacteraemia separately, only chills are related to this finding ($p = 0.013$).

Discussion

A total of 29 patients (12%) with ABP were re-examined in the HES in the follow-up process at 30 days. Among the variables analysed, we did not find an association with the history of prostatitis or prostatic pathology, clinical or analytical data. There were also no differences in the antibiotic nor in the group of patients with inadequate treatment, according to antibiotic susceptibility data, which in the case of *Escherichia coli* are close to 30% for amoxicillin/clavulanic and ciprofloxacin. In the latter case, it might be assumed that the breadth of the sample does not allow a logical relationship to be established. Finally, only the rectal examination and the presence of bacteraemia have been associated with the revisit, and the immunosuppressive treatment is at the limit of the statistical significance ($p = 0.05$).

The utility of rectal examination in ABP is controversial. It has been classically recommended to avoid this manoeuvre in the acute phase of infection by the possibility of causing bacteraemia and even sepsis⁷. In a prospective study involving 48 patients with febrile urinary tract infection to assess the cost effectiveness of rectal examination in the diagnosis of ABP in HES, Smithson et al.⁸ found a sensitivity of 63.3% and a specificity of 77.7%, with significantly lower values among patients over 65 years. In our series, one might think that the association between rectal examination and ED revisit is due to the possibility of secondary bacteraemia, but we have not been able to establish a relationship between the two, either because of sample size or other causes. Considering the data, the possible risks, their relative diagnostic value and that the febrile urinary infection in the male, excluding pyelonephritis, is potentially an ABP, we consider that the systematic practice of rectal tact is not recommended.

Since the confirmation of the existence of bacteraemia is information that is available in a deferred form, it is not very useful to identify patients with a greater probability of ED revisit and, in addition, the routine extraction of blood cultures is a matter of debate in the patients with ABP⁹. The probability of bacteraemia in urinary tract infection is considered intermediate and ranges from 19% to 25%^{10,11} and is more frequent in patients with chills, fever $> 38.4^\circ\text{C}$ and in the absence of previous antibiotic treatment^{9,10}. In this sense, with the availability of urine cultures with a significantly higher yield, is possible to consider whether the bacteraemia

Table 1. Analysis of factors associated with 30-day ED revisit in 241 episodes of acute bacterial prostatitis

Variables	Total (N = 241) n (%)	Revisit (N = 29) n (%)	No revisit (N = 212) n (%)	P Value
Socio-epidemiological				
Age (years) [mean (SD)]	63 (16)	67 (11)	62 (16)	0.813
Mellitus diabetes	47 (19.5)	7 (24.1)	40 (18.9)	0.502
Neoplasm	37 (15.4)	7 (24.1)	30 (14.2)	0.162
Benign prostatic hypertrophy	54 (22.4)	7 (24.1)	47 (22.2)	0.812
Previous Prostatitis	46 (19.1)	2 (6.9)	44 (20.8)	0.075
Bladder catheter/pre-manipulation	40 (16.6)	5 (17.2)	35 (16.5)	0.921
Immunosuppressive treatment	14 (5.8)	4 (13.8)	10 (4.7)	0.050
Antibiotic during the previous month	36 (15)	6 (20.7)	30 (14.1)	0.354
Outpatient antibiotic in progress*	50 (20.7)	3 (10.3)	47 (22.2)	0.141
Acute episode data				
Fever	154 (63.9)	18 (62.1)	136 (64.2)	0.827
Shaking chills	63 (26.1)	7 (24.1)	56 (26.4)	0.794
Tenesmus	100 (41.5)	13 (44.8)	87 (41)	0.698
Voiding syndrome	176 (73)	19 (65.5)	157 (74.1)	0.331
Hematuria	41 (17)	3 (10.3)	38 (17.9)	0.308
Performing rectal examination	190 (78.8)	27 (93.1)	163 (76.9)	0.045
Positive/Performed Urinocultures	104/216 (48.1)	12/29 (41.4)	92/187 (49.2)	0.233
Positive/Performed Haemocultures	24/136 (17.6)	8/24 (33.3)	16/112 (14.3)	0.026
Initial antibiotic therapy				
Amoxicillin-clavulanic	140 (58.1)	17 (58.7)	123 (58)	0.951
Ciprofloxacin	69 (28.6)	9 (31)	60 (28.3)	0.760
Cephalosporins	13 (5.4)	1 (3.4)	12 (5.7)	0.621
Inappropriate antibiotic**	18/116 (15.5)	5/17 (29.4)	13/99 (13.1)	0.087

SD: standard deviation.

* Patients on outpatient antibiotic treatment at the time of the visit to the ED.

** Inadequate treatment according to antibiogram results.

provides relevant information regarding the diagnosis and prognosis of ABP. In general, there is no clear indication of blood culture collection in patients with urinary tract infection¹⁰. However, the proportion of resistance to the usual antibiotics and the factors in each case should be taken into account. In our series, it is especially noteworthy that, in 13 of the 24 positive blood cultures (54%), bacteraemia provides a microbiological diagnosis in patients with negative or contaminated urine cultures, which implies a diagnosis in 9.5% of all blood cultures. Be that as it may, bacteraemia per se is a fact with clinical significance that probably reflects a bacterial infection with high bacterial load, which, according to our data, is associated with a greater probability of revisit.

Although we did not find a significant relationship between reconstitution and the prescribing of an inadequate empirical treatment according to antibiotic sensitivity, it is important to highlight the proportion of resistant strains of *Escherichia coli* in our series, especially for the antibiotics with better diffusion in the tissue as is the case of ciprofloxacin and cotrimoxazole, as well as strains of Enterobacteriaceae bearing ESBL and their predictable increase. In this sense, it is convenient to know the sensitivity pattern in each center to select the initial treatment, to guarantee clinical control and to monitor the microbiological results⁴.

Among the limitations of the study we want to emphasize its unicentric character, although the general characteristics are similar to that of other published works. On the other hand, it emphasizes the relatively small proportion of ED revisits, what conditions the sta-

tistical analysis and the finding of significant differences.

In conclusion, it would seem convenient to consider hospital admission, either in a conventional plant or in short-stay units, in cases of potentially bacteremic ABP. The application of predictive models of bacteraemia^{12,13} or the routine introduction of biomarkers such as procalcitonin^{14,15} could help to identify this subgroup of patients, optimize the treatment and avoid reconstitution as much as possible.

Conflicting interests

The authors declare no conflict of interest related to this article.

Financing

The authors declare the non-existence of external financing of this article.

Ethical Responsibilities

The Ethical Committee for Clinical Research of the University Hospital of Bellvitge evaluated the study and considered the exemption of informed consent due to the observational nature of the project.

All authors have confirmed the maintenance of confidentiality and respect for patients' rights in the author's responsibilities document, publication agreement and assignment of rights to EMERGENCIAS.

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