ORIGINAL ARTICLE

Prognostic implications of emergency department determination of B-type natriuretic peptide in patients with acute heart failure: the PICASU-2 study

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Objective: To investigate whether hospital emergency department measurement of B-type natriuretic peptide (BNP) in patients with acute heart failure is beneficial in terms of patient outcomes and according to hospital category (availability or not of BNP testing in the emergency department).

Method: PICASU-2 is an analytical multicenter retrospective study of patients with acute heart failure according to the Framingham criteria, with follow-up of cohorts. Baseline Data and data pertaining to each acute heart failure episode were collected. Outcome measures were in-hospital mortality, 30-day mortality, and revisits to the emergency department within 30 days. Cases were classified as having a record of BNP measurement or not. Hospital emergency departments were classified as not having the resources for emergency BNP measurement (type A hospital), having the possibility of testing selectively (type B), and testing for BNP more generally (>50% of patients) (type C).

Results: Nineteen hospital emergency departments contributed data on 2423 patients, 32.4% of whom had BNP measurements; by hospital category, 34.7% of the patients were from type A facilities, 34.6% were from type B, and 30.7% were from type C. In-hospital mortality was 7.2%, 30-day mortality was 8.1%, and 24% of the patients revisited within 30 days. Neither the measurement of BNP nor the fact of BNP measurement availability in the emergency department was associated with a better clinical outcome. Likewise no significant associations were found after adjustment for patient status in stable condition or characteristics of the acute episode. When patients who were discharged directly from the emergency department were analyzed separately, again no associations with outcomes were found.

Conclusion: In the absence of a well-established protocol for managing episodes of acute heart failure according to BNP levels, emergency measurement of this peptide does not seem to contribute to improving outcome for these patients. [Emergencias 2011;23:437-446]

Key words: Acute heart failure. Emergency health services. B-type natriuretic peptide (BNP). Clinical course. Mortality. Emergency department revisits.

Introduction

In a healthcare environment in which it is increasingly necessary to quantify the costs of medical activity, knowing whether certain diagnostic tools add value to standard care is of capital importance for the maintenance of the health system[1,2]. Cost-effectiveness and other parameters must also be analyzed in the emergency department (ED). The high level of activity in the ED, often overcrowded, should not prevent such effort[8,9]. The usefulness of the urgent determination of B-type natriuretic peptide (BNP) (each test costing approximately 30 € in May 2011) in the differential diagnosis of acute dyspnea emergencies is well established[3]. However, in patients diagnosed by clinical criteria with acute heart failure (AHF) and treated at ED, the potential added value provided by the BNP test has not been sufficiently explored. The PICASU-1 study showed that a cutoff value of 5180 pg/mL of N-terminal proBNP (NT-proBNP) in the ED allows a moderate but statistically significant discriminative power for predicting in-hospital mortality (AUC 0.75, $p < 0.001$) and 30-day mortality (AUC 0.71, $p < 0.001$), but not 30-day revisits. These findings are independent of whether the patient is admitted or discharged after ED consultation. Consequently, the PICASU-1 study concluded that the NT-proBNP is a useful tool for a priori prediction of a particular patient's death, but had no value for the prediction of ED revisit[11]. However, that study did not answer the question of whether those EDs equipped with the urgent BNP test outperformed those without the test in terms of AHF mortality and ED revisits, nor did it address this question comparing patients who underwent the test versus those that did not. Two recent meta-analyses investigating these aspects found very few randomized studies, which together do not provide conclusive data[12,13]. Therefore, we performed the present PICASU-2 study, in which the null hypothesis was that the urgent determination of BNP (either as BNP or NT-proBNP) in ED patients with AHF is not associated with improved clinical course of these patients, either in the EDs where this possibility exists or in individual patients undergoing the test.

Method

PICASU-2 was an analytical, multicenter, retrospective study with cohort follow-up, using the database generated by the EAHFE 1 and 2 studies, and is a continuation of the PICASU-1 study. The work protocols of EAHFE 1 and 2 were the same and only differed in the date of data collection (2007 and 2009, respectively). EAHFE-1 included 10 Spanish EDs and 1,017 patients[14], while EAHFE-2 involved 20 EDs and 1,483 patients[15]. In both registers patients with AHF were successively included in all centers by researchers from the ICA-SEMES work group, with review of medical records and compliance with the quality criteria of each center.

The present study included all patients from EDs who had recruited no less than 10 AHF patients and introduced their data in the database. These hospital EDs were divided into three groups: a) BNP not available, b) BNP available but limited by action protocols to selected cases (in general, less than 50% of AHF patients), and c) BNP available and widely used (over 50% of cases).

For each case we recorded baseline data (age, sex, relevant medical history and treatment) and data on the acute episode (clinical, laboratory data and treatment administered during ED attendance). Clinical follow-up variables including in-hospital mortality were collected as well as out-of-hospital mortality and ED revisits within 30 days of the index event. We selectively excluded from the study those patients without clinical follow up, which was performed by reviewing the hospital medical record and/or previously authorized telephone contact with the patient. The protocol was approved by the Committee on Ethics and Clinical Research, Hospital Clinic, Barcelona.

Qualitative variables were expressed as absolute values and percentages, and chi-square test for linear trend was applied if there was a relationship between the ordinal categories. Quantitative vari-

ables were expressed as mean and standard deviation, and also compared with chi-square test, for which these variables were dichotomized as necessary. Two types of comparison were performed: between EDs according to the availability of the BNP test and between patients according to whether urgent BNP was performed or not in the ED. The follow-up results are expressed as odds ratio (OR) with 95% confidence intervals (95%CI). This calculation was performed using bivariate study (crude OR) and by multivariate logistic regression to adjust for possible differences in baseline characteristics or the acute episode (adjusted OR). Statistical significance was considered as differences with p value < 0.05 or if the 95%CI of the OR excluded the value 1.

Results

In all, 19 EDs participated in the study, providing a total of 2423 patients. Seven EDs did not determine BNP, 5 did so in selected patients only (collectively, in 31.4% of their AHF patients) and 7 determined BNP on a regular basis (collectively, in 69.9% of their AHF patients) (Table 1). There were no significant baseline differences between patients undergoing the test and those who did not, although diabetes mellitus, atrial fibrillation and chronic treatment with beta-blockers was more common in patients undergoing BNP test. In contrast, the three types of participating EDs showed differences in 8 baseline characteristics (Table 2), discrepancies that with the exception of age persisted despite grouping the two types of HUS with urgent BNP test availability (data not shown). Regarding the acute episodes (Table 3), there were differences between patients with or without BNP determination and between EDs in terms of their ability to offer the test. In the latter case, the grouping of the two types of EDs capable of urgent BNP determination showed the same significant differences with respect to the others, with the exception of hypoxemia and intravenous nitrate infusion, for which the differences disappeared (data not shown).

A total of 174 (7.2%) patients died during hospital stay. Overall 30-day mortality rate was 8.1% (196 patients) and 30-day revisits after the index event was 24% (581 patients). Neither BNP determination in a particular patient (Figure 1) nor availability of the test (Figure 2) improved prognosis for in-hospital or 30-day mortality. In contrast, 30-day revisit to the ED was higher in patients undergoing the test and in those treated at EDs with urgent BNP test available, significantly so according to type of ED (Figures 1 and 2). The same was found for the subgroup of patients dis-

Table 1. Contribution of patients by each participating hospital according to urgent BNP test availability in the emergency department

Hospital	No. patients included	No. patients with BNP test	Type of peptide
Without possibility of determining BNP			
Hospital Universitari de Bellvitge	309	0 (0%)	Not available
Hospital Universitario de Salamanca	135	0 (0%)	Not available
Hospital Marqués de Valdecilla de Santander	130	0 (0%)	Not available
Hospital de Alcorcón	96	0 (0%)	Not available
Hospital Clínic de Barcelona	83	0 (0%)	Not available
Hospital Virgen de la Macarena de Sevilla	73	0 (0%)	Not available
Hospital Clínico Universitario de Santiago de Compostela	14	0 (0%)	Not available
Subtotal	840 (34.7%)*	0 (%)	
BNP test applied in selected cases			
Hospital Clínico San Carlos de Madrid	318	125 (39.3%)	NT-proBNP
Hospital General de Alicante	220	71 (32.3%)	NT-proBNP
Hospital Universitario Central de Asturias	174	25 (14.4%)	NT-proBNP
Hospital Miguel Servet de Zaragoza	93	36 (38.7%)	NT-proBNP
Hospital del Mar de Barcelona	33	6 (18.2%)	NT-proBNP
Subtotal	838 (34.6%)*	263 (31.4%)	
BNP or NT-proBNP test applied in all cases			
Hospital Dr. Negrín de las Palmas de Gran Canaria	256	156 (60.9%)	NT-proBNP
Hospital la Fe de Valencia	177	116 (65.5%)	NT-proBNP
Hospital Reina Sofía de Córdoba	120	70 (58.3%)	BNP
Hospital Insular de las Palmas de Gran Canaria	86	82 (95.3%)	NT-proBNP
Hospital Virgen de la Victoria de Málaga	54	50 (92.6%)	NT-proBNP
Hospital General Yagüe de Burgos	31	30 (96.8%)	NT-proBNP
Hospital Valme de Sevilla	21	17 (81.0%)	BNP
Subtotal	745 (30.7%)*	521 (69.9%)	
Total	**2,423**	**784 (32.4%)**	

*% of total number of patients. BNP: B-type natriuretic peptide. NT-proBNP: N-terminal proBNP.

Table 2. Baseline data of patients included in the study, compared according to whether patients underwent urgent BNP test in the emergency department (ED) or not, and according to ED possibility of BNP determination

	Total N (%)	Patients without BNP test N (%)	Patients with BNP test N (%)	p value	EDs N (%)	EDs applying BNP in selected cases N (%)	EDs applying BNP test in all cases N (%)	p value
Age > 70 years	1,962 (83.0)	1,331 (83.7)	631 (81.6)	0.23	672 (80.0)	712 (85.0)	578 (77.6)	< 0.001
Male	1,087 (44.9)	739 (45.1)	348 (44.4)	0.75	377 (44.9)	372 (44.4)	338 (45.4)	0.92
Hypertension	1,963 (81.5)	1,317 (80.8)	646 (82.8)	0.23	647 (77.8)	698 (83.5)	618 (83.3)	< 0.01
Diabetes mellitus	1,044 (43.3)	680 (41.7)	364 (46.7)	< 0.05	320 (38.5)	341 (40.8)	383 (51.7)	< 0.001
Dyslipidemia	816 (33.9)	543 (33.3)	273 (35.0)	0.41	270 (32.5)	287 (34.3)	259 (34.9)	0.55
Smoking	196 (9.6)	141 (9.6)	55 (9.6)	1.00	59 (7.9)	77 (12.0)	60 (9.1)	< 0.05
Ischemic heart disease	767 (31.9)	504 (30.9)	263 (33.8)	0.16	250 (30.1)	251 (30.0)	266 (35.9)	< 0.05
Valve disease	574 (23.8)	390 (24.0)	184 (23.6)	0.84	231 (27.8)	198 (23.7)	145 (16.9)	0.001
Chronic atrial fibrillation	1,094 (45.5)	711 (43.7)	383 (49.2)	0.01	350 (42.2)	407 (48.7)	337 (45.5)	< 0.05
Chronic renal failure	320 (21.9)	164 (21.0)	156 (23.0)	0.39	92 (18.4)	111 (24.7)	117 (22.9)	0.05
Peripheral vascular disease	165 (6.8)	120 (7.4)	45 (5.8)	0.18	55 (6.6)	68 (8.1)	42 (5.7)	0.14
Cerebrovascular disease	261 (10.8)	174 (10.7)	87 (11.2)	0.78	73 (8.8)	101 (12.1)	87 (11.7)	0.06
Chronic neuropathy	567 (23.6)	365 (22.4)	202 (26.1)	0.06	183 (22.1)	187 (22.4)	197 (26.7)	0.06
Previous heart failure	1,657 (72.5)	1,135 (72.6)	522 (72.1)	0.84	560 (71.7)	595 (74.4)	502 (71.1)	0.31
Treatment with beta-blockers	675 (29.0)	427 (26.7)	248 (33.8)	< 0.001	226 (27.8)	239 (29.2)	210 (30.0)	0.62
Treatment with ACEI or ARBs	1,314 (56.4)	888 (55.6)	426 (58.2)	0.26	439 (54.0)	471 (57.6)	404 (57.8)	0.23
Baseline Barthel Index < 60 points	492 (21.7)	340 (22.2)	157 (20.6)	0.39	186 (25.1)	175 (21.9)	131 (18.1)	< 0.01
Baseline NYHA III-IV	593 (26.0)	389 (25.2)	204 (27.6)	0.24	177 (23.0)	220 (27.1)	196 (28.0)	0.06

BNP: B-type natriuretic peptide; ACEI: angiotensin converting enzyme inhibitors; ARA-II: angiotensin II receptor antagonists.

charged directly from the ED when analyzed separately (Figures 1 and 2).

Overall, these findings were maintained after adjustment for confounding factors such as the patient's history and characteristics of the acute episode. So, the determination of BNP was not associated with better prognosis regarding 30-day mortality or reduced rate of ED revisits at 30 days (Figure 3). We even observed a greater likelihood of ED revisits in the subgroup of patients discharged directly from the ED in those undergoing the test (Figure 4). In addition, BNP test availability in the ED did not improve 30-day mortality overall (Figure 5) or in the subgroup of patients discharged directly from the ED (Figure 6) and worsened the rate of 30-day ED revisits in some cases (Figures 5 and 6).

Discussion

In individual patients, BNP is an established prognostic biomarker to predict the course of disease and prognosis of patients with AHF: high lev-

Table 3. Data from the acute episode of the patients included in the study, compared according to whether patients underwent urgent BNP test in the emergency department (ED) or not, and according to ED possibility of BNP determination

	Total N (%)	Patients without BNP test N (%)	Patients with BNP test N (%)	p value	ED without BNP N (%)	EDs applying BNP in selected cases N (%)	EDs applying BNP test in all cases N (%)	p value
Sinus tachycardia at rest	622 (26.9)	391 (25.3)	231 (30.2)	0.01	184 (23.0)	212 (27.3)	226 (30.8)	< 0.01
SBP < 100 mm Hg	118 (5.0)	80 (5.1)	38 (4.9)	0.94	36 (4.4)	49 (6.2)	33 (4.5)	0.20
SBP > 160 mmHg	558 (23.8)	346 (22.0)	212 (27.4)	< 0.01	177 (21.7)	179 (22.5)	202 (27.4)	< 0.05
Anemia (Hematocrit < 0.36) [n (%)]	1,316 (60.6)	879 (60.5)	437 (60.1)	0.88	491 (62.6)	413 (55.9)	412 (62.8)	< 0.01
Renal failure (GFR < 60 mL/h)	1,200 (57.2)	785 (56.3)	415 (59.1)	0.23	392 (52.6)	425 (62.0)	383 (51.4)	< 0.01
Hyponatremia	443 (20.5)	274 (19.2)	169 (23.0)	< 0.05	142 (17.5)	174 (23.4)	127 (20.9)	< 0.05
Troponin elevation	117 (28.6)	57 (27.9)	60 (29.3)	0.85	43 (33.3)	28 (20.4)	46 (32.2)	< 0.001
Hypoxemia (O_2 saturation ≤ 90%)	704 (31.9)	481 (33.1)	223 (29.7)	0.12	239 (30.6)	272 (39.0)	193 (26.5)	< 0.001
Treatment								
Conventional oxygen	1,925 (82.4)	1,346 (85.4)	579 (76.3)	< 0.001	734 (91.8)	688 (84.4)	503 (69.9)	< 0.001
Non-invasive ventilation	141 (10.2)	61 (8.4)	80 (12.2)	< 0.05	26 (5.5)	28 (6.5)	87 (17.8)	< 0.001
Loop diuretics bolus	2,113 (90.5)	1,398 (88.6)	715 (94.2)	< 0.001	752 (93.9)	684 (83.9)	677 (94.0)	< 0.001
Continuous infusion diuretics	291 (12.5)	202 (12.8)	89 (11.7)	0.50	28 (3.5)	224 (27.5)	39 (5.4)	< 0.001
Continuous infusion nitroglycerin	583 (25.0)	367 (23.3)	216 (28.5)	< 0.01	199 (24.8)	165 (20.2)	219 (30.4)	< 0.001
Maintenance of beta-blockers	272 (11.7)	162 (10.3)	110 (14.5)	< 0.01	31 (3.9)	135 (16.6)	106 (14.7)	< 0.001
Maintenance of ACEI or ARA-II	842 (36.1)	532 (33.8)	310 (41.0)	0.001	122 (15.3)	377 (46.3)	343 (47.7)	< 0.001
Hospital	1,711 (70.8)	1,225 (74.9)	486 (62.2)	< 0.001	555 (66.4)	696 (83.1)	460 (62.0)	< 0.001

SBP: systolic blood pressure; GFR: glomerular filtration rate; ACEI: angiotensin converting enzyme inhibitors; ARA-II : angiotensin II receptor antagonists.

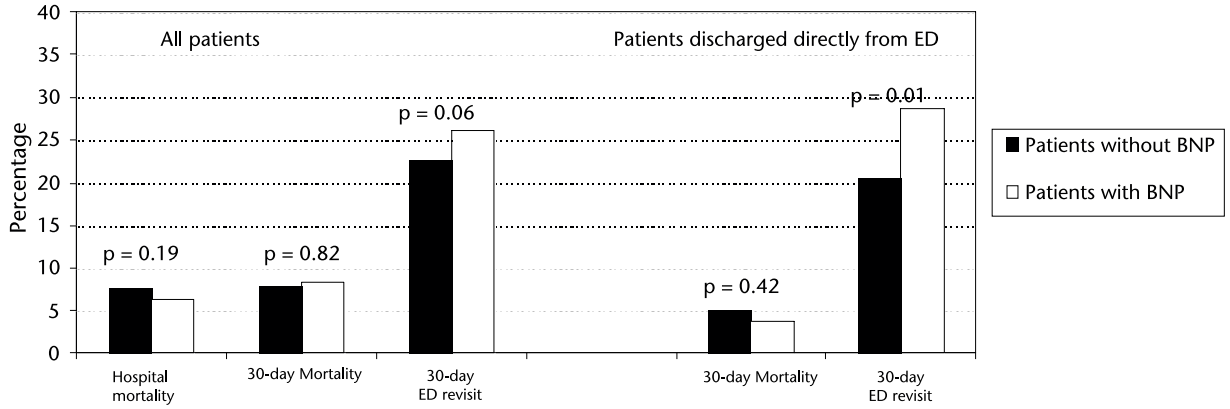

Figure 1. Evolutionary markers studied, according to whether patients underwent urgent BNP (B-type natriuretic pepetide) test in the emergency department (ED) or not.

els are associated with negative outcomes[16-20]. This discriminative capability is also evident when the test is performed in the ED1[21-22], and therefore some have suggested it should be available for immediate use to evaluate AHF in the ED. Apart from this possibility of qualifying individual patient prognosis, it has been argued that BNP testing may also have a beneficial role in the overall prognosis of patients treated in the ED, either by decreasing early mortality or revisits to the ED. Now, this has been investigated elsewhere, outside of Spain[12,13], but it is well known that ED care and organizational characteristics are specific to each country and their health models, so the results cannot be directly extrapolated[23-26]. The present PICASU-2 study evaluated this issue, for the first time in Spain, and showed that in the absence of a well-defined protocol for requesting the test and management of the patient depending on the BNP test results, its urgent determination in the ED is of no value in terms of improving the course of disease.

AHF in Spain has traditionally been the sole preserve of cardiologists and internists, who have provided the bulk of knowledge to other professionals involved in patient care. Recently, ED research teams have reported on some interesting aspects hitherto unknown which complement our knowledge of this syndrome. For example, up to one third of AHF patients are managed entirely in the ED[7]. In these patients, independent factors of poor prognosis do not coincide with those previously published regarding hospitalized patients[15,27,28]. Also, the treatment administered in the ED differs, in some respects, from that set out in the treatment guidelines of the European Society of Cardiology[29,30]. Among them, noninvasive ventilation is clearly underutilized in the ED[31,32]. In addition, training measures in the ED aimed at correcting these defects are only partially successful[33]. Thus consensus guidelines on the management of AHF in the ED have recently been published in an attempt to corect all these issues[34].

One problem of AHF management that has

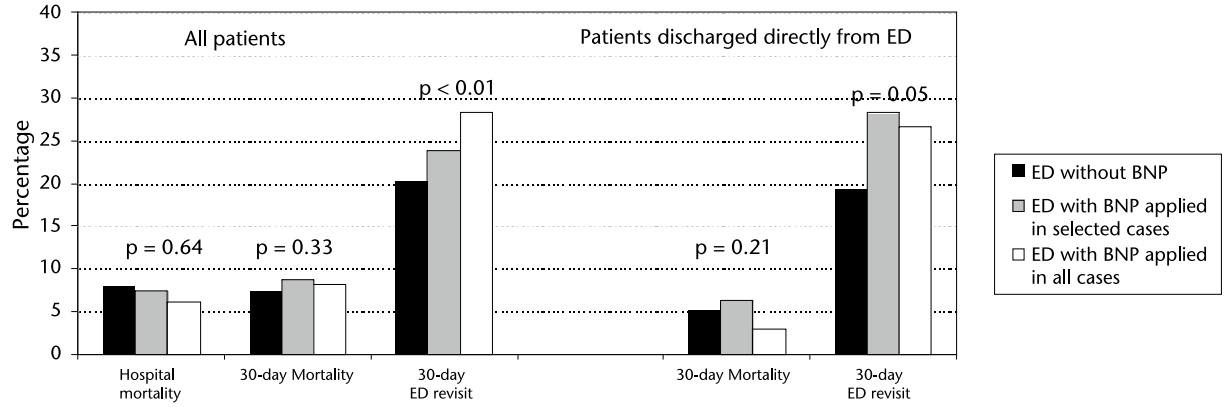

Figure 2. Outcome of patients studied in terms of the availability of urgent type B natriuretic peptide test in the emergency department (ED).

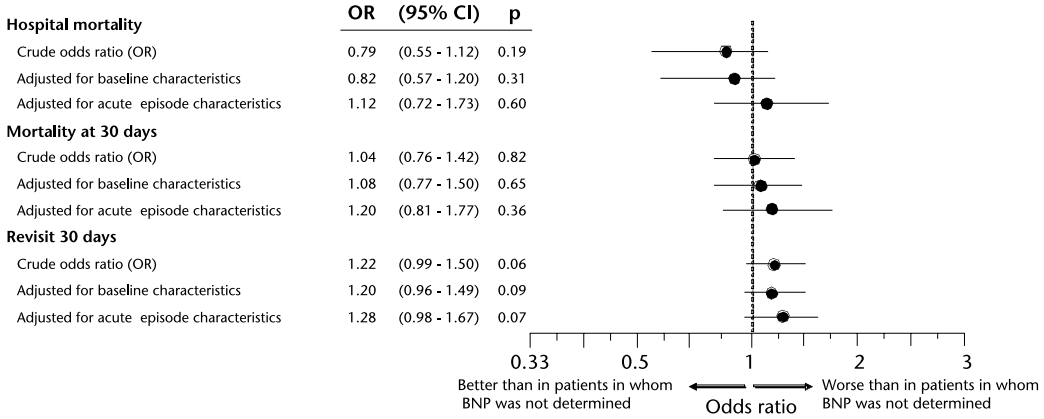

Figure 3. Crude and adjusted odds ratios of different evolutionary markers for patients with acute heart failure who underwent urgent B-type natriuretic peptide (BNP) test in the emergency department. Study for the whole series.

not been solved is the high rate of mortality and ED revisits in the weeks after the event. Therefore, any strategy to decrease these rates is important and must necessarily begin in the ED. In this context, BNP determination in the ED has been considered. However, four randomized trials have addressed this issue from the perspective of the ED, and their results have been quite consistent: this strategy has not been shown to be useful[35-38]. In fact, their results have been very similar to those found in the present PICASU-2 study. Although the latter was not a randomized study, it was carried out entirely in Spanish EDs (Table 4) and focused on patients who met Framingham clinical criteria for AHF[39], which excludes the heterogeneity of patients with various types of dyspnea. In addition, PICASU-2 included a sufficient number of cases to allow analysis of a subgroup of patients discharged directly from the ED, which has not been previously evaluated. Again, in this scenario, BNP test availability has not brought benefits in terms of patient evolution, and ED revisits increased. This could be due to a false sense of certainty induced by confirmation of AHF due to a high BNP, which leads to the decision to discharge the patient from the ED, a circumstance that goes against common sense since the patient really has worse prognosis. Therefore, we believe that in the absence of a clearly defined algorithm for use, the strategy of applying urgent BNP in all ED patients with AHF should not be adopted, mainly for cost-benefit reasons.

The PICASU-2 study analyzed the impact of urgent BNP test use in the ED on patient outcomes. It showed no better results, either overall or in patients discharged directly from the ED. This means that these EDs bear an additional expense, (which can be quantified for an average ED as 20,000-25,000 euros per year according to our data), which does not add value beyond the diagnostic potential of BNP in cases of doubt. And this is an-

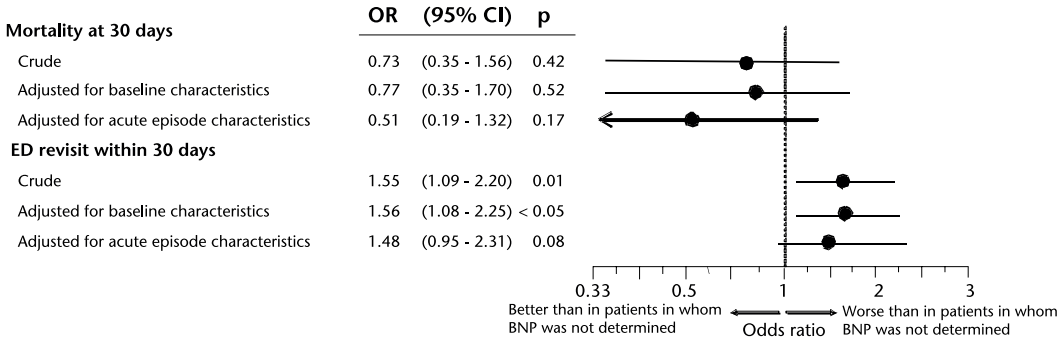

Figure 4. Crude and adjusted odds ratios of different evolutionary markers for patients with acute heart failure who were urgently found the B-type natriuretic peptide (BNP) in the emergency department (ED). Study for the subgroup of patients who were discharged directly from ED.

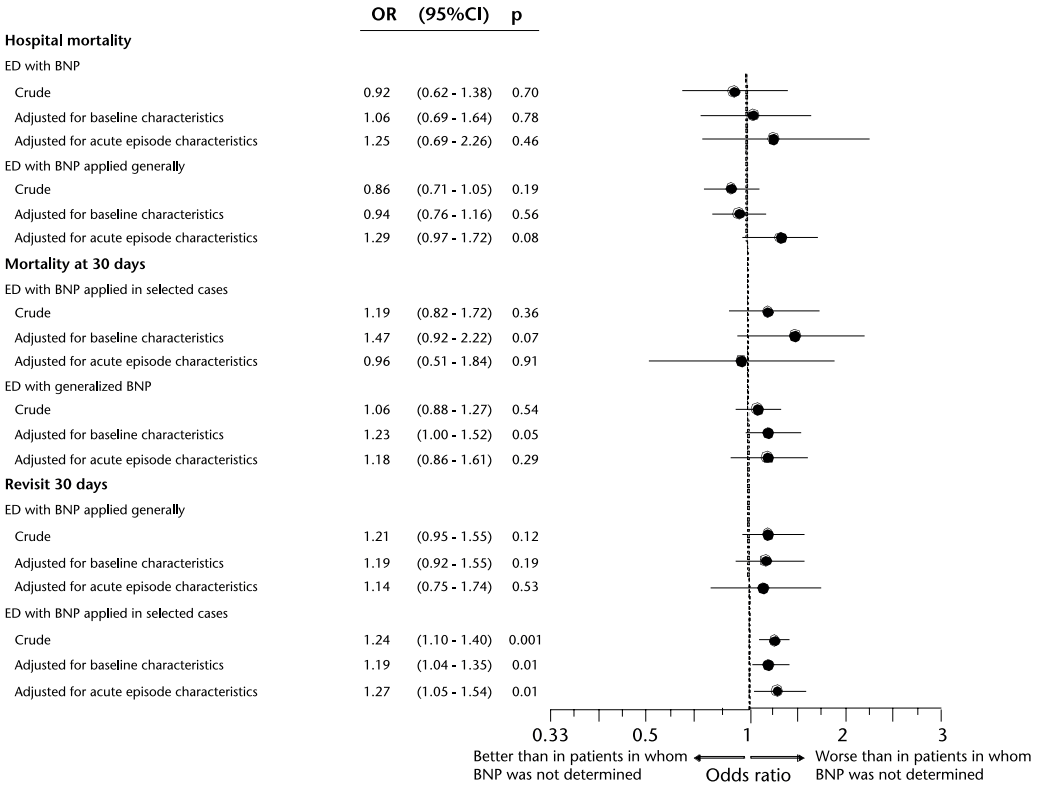

Figure 5. Crude and adjusted odds ratios of different evolutionary markers of acute heart failure patients in hospitals where urgent B-type natriuretic peptide (BNP) test was available in the emergency department (ED). EDs without BNP test availability are the reference category. Study of the whole series.

other reason to try to improve the efficiency of our medical activities in times of crisis[40].

However, we believe that BNP test can help stratify certain high-risk patients[41,42], who at discharge require follow up with multidisciplinary action protocols and self-care support. All of these

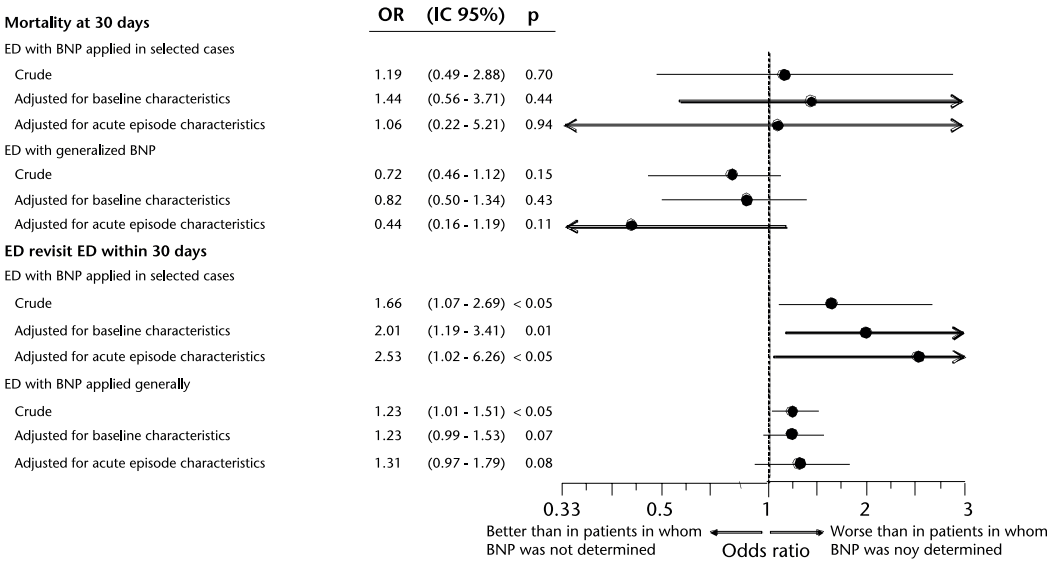

Figure 6. Crude and adjusted odds ratios of different evolutionary markers of acute heart failure patients in hospitals where urgent B-type natriuretic peptide (BNP) test was avail, in the emergency department (ED). EDs without BNP test availability are the reference category. Study of the subgroup of patients who were discharged directly from the ED.

Table 4. Results of major studies comparing outcomes in patients with acute heart failure (AHF) who underwent urgent B-type natriuretic peptide (BNP) test in the emergency department versus those who did not undergo this test

	Mueller *et al.*[34]	Rutten *et al.*[35]	Moe *et al.*[36]	Schneider *et al.*[37]	Miró *et al.*present study
Identification of the study	–	–	IMPROVE-CHF	–	PICASU-2
Type of study	Prospective, randomized	Prospective, randomized	Prospective, randomized	Prospective, randomized	Retrospective
Country	Switzerland	Netherlands	Canada	Australia	Spain
Number of hospitals	1	1	7	2	18
Inclusion period patients	05/2001 a 04/2002	12/2005 a 02/2006	12/2004 a 12/2005	08/2005 a 03/2007	04/2007 y 05/2009
Type of patients	With dyspnea	With dyspnea	With dyspnea	With dyspnea	With AHF (Framinham)
No. patients (with/without BNP)	225/227	236/241	246/254	306/306	784/1639
Overall percentage of admission	80.1	64.8	57.0	88.6	70.8
Hospital mortality					
– Overall percentage	7.5	6.1	3.4	NA	7.2
– Crude OR (95%CI) with BNP	0.60 (0.29-1.23)	0.95 (0.45-2.01)	1.93 (0.70-5.31)	NA	0.79 (0.55-1.12)
Mortality at 30 days					
– Overall percentage	11.1	6.9	4.8*	6.7	8.1
– Crude OR (95%CI) with BNP (total)	0.77 (0.43-1.39)	0.84 (0.41-1.71)	1.23 (0.54-2.81)	0.94 (0.50-1.79)	1.04 (0.76-1.42)
– Crude OR (95%CI) with BNP (discharged from ED)	NA	NA	NA	NA	0.73 (0.35-1.56)
ED revisit within 30 days					
– Overall percentage	10.8	4.0	16.8*	16.5	24.0
– Crude OR (95%CI) with BNP (total)	1.16 (0.64-2.10)	0.58 (0.23-1.51)	0.62 (0.38-0.99)	0.81 (0.53-1.24)	1.22 (0.99-1.50)
– Crude OR (95%CI) with BNP (discharged from ED)	NA	NA	NA	1.10 (0.35-3.46)	1.55 (1.09-2.20)

* Calculated at 60 days. NA: not analyzed.

have proved effective, virtually regardless of how they are implemented, whether by telephone, outpatient consultation, tele-monitoring, home hospitalization or other strategies[36,37].

The present study has several limitations. First, it was a a retrospective study, although the analysis it performed in no way conditioned the routine management of AHF patients according to BNP values, and therefore the results reflect its utility in vivo and not in vitro. Second, the diagnosis of AHF was based on clinical criteria, but taking into account its high specificity, the only limitation was the limited sensitivity of the criteria so we could possibly have included a broader spectrum of cases. Third, we did not take into account the values of BNP, only whether the test was requested or not in the ED. However, if there were a clear protocol and consensus on BNP determination, it might prove to add value and justify its cost. Finally, we did not use a biomarker that was common to all centers with standardized cutoffs and validated for different age groups.

Although BNP determination for clinical purposes has been around for more than a decade, its utility is still the subject of intense debate[45-50]. In the case of AHF patients treated in EDs, the results of this study strongly suggest the test is not useful to predict outcomes and it was not associated with better prognosis. It is therefore necessary to urgently review the basis for BNP use in the ED in Spain.

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Implicaciones pronósticas de la posibilidad de determinar con carácter urgente el péptido natriurético tipo B en el servicio de urgencias en pacientes con insuficiencia cardiaca aguda: estudio PICASU-2

Miró O, Jacob J, Martín-Sánchez FJ, Herrero P, Pavón J, Pérez-Durá MJ, Noval A, Segura F, Richard F, Giménez A, Gil C, Alonso H, Ruiz M, Garrido M, Gil Román JJ, Aguirre A, Torres JM, Ruiz F, Perelló R, Villena H, Richard F, Gil V, Llorens P

Objetivo: Investigar si la determinación del péptido natriurético tipo B (BNP) con carácter urgente en el servicio de urgencias hospitalario (SUH) a pacientes con insuficiencia cardiaca aguda (ICA) proporciona ventajas en cuanto a la evolución clínica a los pacientes en los que se determina o a los SUH que disponen de dicha posibilidad.
Método: El estudio PICASU-2 es un estudio de carácter analítico, multicéntrico, retrospectivo y con seguimiento de co-

hortes que incluyó pacientes diagnosticados basales y de ICA. Para cada caso se consignaron los datos del episodio agudo. Como variables evolutivas se recogió la mortalidad intrahospitalaria y la mortalidad y la reconsulta a urgencias los 30 días siguientes. Los pacientes se dividieron entre los que se determinó BNP urgente y los que no. Los SUH se dividieron entre los que no tienen disponibilidad de determinar BNP urgente (tipo A), los que pueden hacerlo en casos seleccionados (tipo B) y los que lo hacen de forma generalizada (tipo C).
Resultados: Participaron 19 SUH, que incluyeron 2.423 pacientes: en el 32,4% se determinó BNP, mientras que su distribución en SUH tipo A, B y C fue del 34,7%, 34,6% y 30,7%, respectivamente. La mortalidad intrahospitalaria fue 7,2%, la mortalidad a 30 días 8,1% y la reconsulta a 30 días 24%. Ni la determinación de BNP en un paciente concreto ni el hecho que el SUH lo tuviese a su disposición se asociaron a un mejor pronóstico, ni tampoco después de ajustar el modelo por las diferencias basales o del episodio agudo entre grupos. Estos mismos resultados se obtuvieron cuando se analizó el subgrupo de pacientes dados de alta directamente de urgencias.
Conclusión: En ausencia de un protocolo bien definido de solicitud y manejo del paciente en función del BNP, su determinación con carácter urgente en el SUH no aporta ningún valor en la mejoría evolutiva de los pacientes con ICA. [Emergencias 2011;23:437-446]

Palabras clave: Insuficiencia cardiaca. Urgencias. BNP. Evolución. Mortalidad. Reconsulta.