AUTHORS' CONTRIBUTIONS

R. Ladrón-Abia performed data collection and analysis and drafted the manuscript. B. Manso García, P. Cejudo Ramos and P. Gallego critically analyzed the work and drafted and revised the manuscript. M. Gaboli and M.J. Rodríguez Puras revised the manuscript.

CONFLICTS OF INTEREST

None.

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Early hospital discharge after cardiac electrophysiology procedures without outpatient clinic support

Alta precoz tras procedimientos ambulatorios de electrofisiología cardiaca sin el apoyo del hospital de día

To the Editor,

The coronavirus disease 2019 (COVID-19) pandemic has required changes in the workflow of medical procedures, including those related to cardiology and electrophysiology. In 2020, guidance was published to maximize the safety of health care personnel and patients during cardiac electrophysiology procedures during the pandemic.[1] The article emphasizes the use of the outpatient setting for some procedures. Since the beginning of 2022, there has been an increase in hospital workload, which has reduced the availability of hospital beds for patients undergoing outpatient interventions. In this context, many hospitals have adapted to this new reality and have found that earlier discharge is feasible and safe. Previously, Marijon et al.[2] demonstrated that

Table 1
Characteristics of the patients and results

	2022	2018-2019	
Total number ambulatory procedures	230	221	
	VEDP	SP	*P*
Number	185 (80.4)	189 (85.5)	ns
Age, y	63 [50.5-76]	64 [52-75]	ns
Women	62 (33.5)	81 (42.8)	< .001
Hours after discharge	3.5 [2.5-4.13]	24 [22.8-25.5]	< .001
Puncture number	2 [1-2]	2 [2-3]	ns
Electrophysiology			
Number	89	106	
Age, y	56 [44-68]	54 [43-65.5]	ns
Female sex	40 (44.9)	50 (47.1)	ns
Hours after discharge	3.75 [3-4.25]	23.5 [22.3-25]	< .001
Puncture number	2 [2-3]	2 [2-3]	ns
Diagnostic only	19 (21.3)	6 (5.6)	.046
Therapeutic	70 (78.7)	100 (94.4)	.046
IRT ablation	27 (30.3)	36 (34)	ns
Accesory pathway ablation	9 (10.1)	16 (15.1)	
AT ablation	1 (1.1)	2 (1.9)	
AV node ablation	4 (4.5)	2 (1.9)	

Table 1 *(Continued)*
Characteristics of the patients and results

	2022	2018-2019	
AF RF ablation	3 (3.4)	0 (0)	.001
CVT isthmus ablation	19 (21.4)	36 (34)	.002
VT/VE ablation	7 (7.9)	6 (5.7)	ns
Devices			
Number	98	83	
Age, y	72 [58.3-78.8]	75 [66.5-80]	.03
Female sex	22 (22.4)	31 (37.3)	< .001
Hours after discharge	3.25 [2.38-4]	25 [23.3-26]	< .001
Puncture number	2 [1-2]	2 [1-2]	ns
PM single	15 (15.3)	28 (33.7)	< .01
PM single physiologic pacing	3 (3)	0 (0)	
PM dual	36 (36.7)	35 (42.2)	
PM dual physiologic pacing	5 (5.1)	1 (1.2)	
CRT-P	2 (2)	2 (2,4)	
ICD single	22 (22.4)	11 (13.2)	
ICD dual	7 (7.1)	1 (1.2)	
CRT-D	10 (10.2)	5 (6)	
Antithrombotic treatment			
OAC	58 (31.4)	66 (34.9)	ns
APT	39 (21.1)	31 (16.4)	
Dual APT	7 (3.8)	5 (2.6)	
OAC+APT	4 (2.2)	6 (3.2)	
Complications			
Total	4 (1.7)	6 (2.6)	ns
Devices	2 (1.01)	2 (1)	
EP	1 (0.5)	4 (2.1)	
Acute (predischarge)			
Atrial lead dislogement	1 (0.5)		ns
Neumothorax		1 (0.5)	
Tamponade	1 (0.5)		
APE during VT ablation		1 (0.5)	
After discharge until day 30			
ICD infection	1 (0.5)		ns
Pocket bleeding		1 (0.5)	
Pericarditis		2 (1)	
AVB postablation		1 (0.5)	

APE, acute pulmonary edema; AF, atrial fibrillation; APT, antiplatelet therapy; AT, atrial tachycardia; AVB, atrioventricular block; AVN, atrioventricular node; CRT, cardiac resynchronization therapy; CRT-D, CRT-Defibrillator; CRT-P, CRT-pacemaker; CVT, cavotricuspid isthmus; Dual, dual-chamber; ICD, implantable cardioverter-defibrillator; IRT, intranodal reentrant tachycardia; OAC, oral anticoagulation; PM, pacemaker; PVC, premature ventricular contraction; RF, radiofrequency; Single, single-chamber; SP, standard protocol; VE, ventricular extrasystole; VEDP, very early discharge protocol; VT, ventricular tachycardia.

early discharge protocols (4-6 hours) for patients undergoing uncomplicated radiofrequency ablation were safe and applicable in routine clinical practice. The document also highlights higher patient satisfaction (in relation to shorter hospital stay), as well as cost savings.

In 2022, Rashedi et al.[3] published a systematic review and meta-analysis of the safety and efficacy of early discharge after atrial fibrillation ablation, supporting the adoption of these protocols. The support of a day hospital has allowed many arrhythmia units to implement early discharge protocols (6-8 hours) for cardiac device implantation, reducing costs and increasing patient satisfaction.[4,5] In addition, for these patients, the widespread use of remote monitoring has enhanced the safety of these procedures even further.[6] In summary, outpatient interventional cardiac procedures have become increasingly common, increasing satisfaction rates and reducing costs, without affecting procedural safety. For all these reasons, in April 2022, we started a very early discharge protocol (VEDP) for a series of electrophysiology procedures and first implantation of devices despite not having a day hospital for postprocedure monitoring.

We conducted a comparative analysis with a historical cohort of outpatients with a standard protocol (SP) from September 2018 to April 2019. In accordance with ethics guidelines, all participating patients provided informed consent, and the study received approval from the appropriate ethics committee. Informed consent forms were duly obtained and archived.

We analyzed acute complications (prior to discharge) and those requiring some type of medical intervention within the first 30 days, particularly those causing prolongation of hospital stay. The VEDP included 185 patients and the SP included 189. All

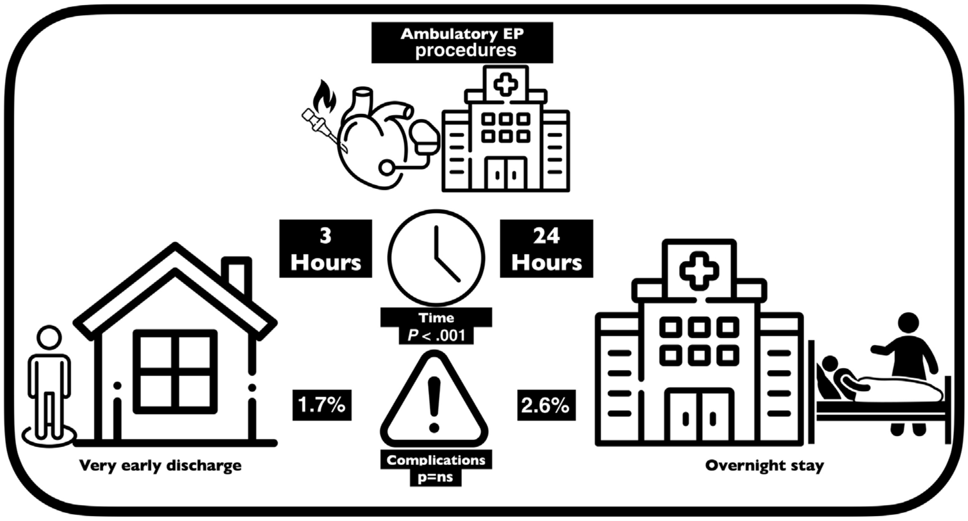

Figure 1. Schematic summary of study results. EP, electrophysiology.

procedures were performed in a cardiac electrophysiology laboratory.

In the VEDP, after the procedure, patients remained in a room adjacent to the electrophysiology laboratory, with standard monitoring until discharge, which involved the monitoring by a part-time nurse (who carries out the presurgical preparation of the single electrophysiology laboratory and the 2 catheterization laboratories in the same area). Additionally, an electrocardiogram and chest X-ray were performed, if an implant was performed, in addition to checking the surgical wound or puncture site. The SP involved an elective admission until the morning after the procedure in the cardiology inpatient ward, without continuous monitoring and with standard nursing care. Both groups maintained the same antithrombotic treatment management protocol, and a remote monitoring system was provided to all patients undergoing device implantation prior to discharge.

Table 1 and figure 1 show a summary of all the procedures performed and the characteristics analyzed regarding their safety. The average length of stay was significantly lower (3.25 vs 25 hours) in the VEDP group, both for device implantations ($P < .001$) and for electrophysiology procedures ($P < .001$). There were no statistically significant differences in the total number of complications (4 vs 6), even when we distinguished between acute complications and those occurring within the first 30 days after discharge. Four patients in the VEDP underwent pacemaker implantation and atrioventricular node ablation in the same procedure. More ablations were performed in the SP (100 vs 70, $P = .046$). One VEDP patient required admission due to tamponade in the context of ablation of right ventricular outflow tract extrasystole, and another required repositioning of an atrial lead, which was performed at the end of the day; the patient was discharged on the same afternoon as the procedure. Among patients undergoing de novo implantation, those in the VEDP group were slightly younger (72 vs 75 years, $P = .003$), and there were more women in the SP group (22.4% vs 37.3%, $P < .001$).

The protocol avoided 184 days of hospital stay (20.4 days per month) and could be applied to 80.4% of all patients referred to our unit for invasive procedures. Very few patients undergoing redo cryoablation for atrial fibrillation were included in the first group and therefore we were unable to assess the safety of the protocol in that context.

In conclusion, these results suggest that the VEDP for outpatients undergoing de novo implantation of cardiac stimulation devices or electrophysiology studies in an electrophysiology laboratory is safe and efficient in selected patients, without the support of a day hospital.

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AUTHORS' CONTRIBUTIONS

L. Álvarez-Acosta and J. Hernández-Afonso conceived the study. All authors verified the analytical methods. J. Hernández-Afonso and P. Ruiz-Hernández encouraged L. Álvarez-Acosta to make the comparison with a prior cohort and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

CONFLICTS OF INTEREST

None of the authors have any conflicts of interest related to this article.

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Time trend, willingness and knowledge of law enforcement agencies officers to act as first responders in out-of-hospital cardiac arrests

Tendencia temporal, disposición y conocimientos de los agentes de las fuerzas del orden público para actuar en paradas cardiacas extrahospitalarias

To the Editor,

Time between the onset of cardiorespiratory arrest and cardiopulmonary resuscitation (CPR) is a key prognostic factor, with survival rates decreasing by 5% to 10% for each minute of delay.[1] In out-of-hospital cardiac arrests (OHCA), immediate CPR usually depends on bystander action.[2]

Law enforcement agencies (LEA) have more units and are more geographically dispersed than emergency medical services. In addition, during workdays they are usually ready to act when on patrol. Consequently, they are frequently first responders in emergencies. In the United States, police or firefighters initiated CPR in 31.8% of OHCA.[3] In Spain, only 24.1% of Local Police and 11.2% of Civil Guard officers had ever performed CPR in real-life situations.[4] However, although CPR training is included in the training plan for LEAs in Spain, there are no regulations for periodic refresher courses. Conversely, in most high-income countries, LEAs are integrated within emergency systems and dual mobilization is encouraged. Studies have found favorable results in survival and neurological outcomes when CPR was initiated by properly trained LEA officers.[3]

Considering these data, we were interested in determining the time trend for the rates of LEA intervention in OHCA and in estimating officers' knowledge of this procedure and willingness to act as first responders. To achieve these objectives, we first conducted a retrospective study of activations and LEA interventions in emergencies involving OHCA from 2016 to 2019, with the permission of the Clinical Research Ethics Committee of Asturias (Spain). Cases of OHCA were identified using registers from the Coordinating Center for Emergencies of Asturias (Spain) and were later linked to medical records of the emergency department to determine whether LEA were simultaneously dispatched. We also classified LEA interventions according to activator. Nevertheless, limitations of the study were that the records did not allow us to determine the specific LEA activated (National Police, Local Police or Civil Guard) or identify situations where LEA officers were the first activated emergency medical units to arrive.

Second, we performed a cross-sectional study among Local Police and Civil Guard officers of Asturias to describe training, knowledge of CPR, and willingness to perform this procedure (2017 to 2019). All participants provided informed consent and the study protocol was approved by the Clinical Research Ethics Committee of Asturias (Spain). The Local Police cover mainly urban areas whereas the Civil Guard cover rural settings. The National Police Agency was also invited as their agents are potentially first responder in urban areas, but refused to participate, which constituted another limitation. Finally, the study involved 1183 officers (67.0% from the Civil Guard). Officers were surveyed using a questionnaire that included CPR training intervals (never, $>$ 2 years, $\leq$ 2 years since the last course); willingness to act in OHCA, based on responses to 4 questions (responses were summed to obtain a 4-point scale, with higher values indicating higher willingness); and knowledge of CPR, which was summarized in 9 questions based on the 2015 international recommendations for adults (responses were translated to a 10-point scale, with 10 representing highest knowledge). The questionnaire was designed by a mixed panel of experts in out-of-hospital emergencies and psychometric evaluation.[4]

The frequency of LEA activation in emergencies involving OHCA is shown in table 1. Although the number of OHCA alerts remained stable during the study period, there was an increasing trend in the activation of LEA agents (*P* trend = .003). This increase was due to increased demand from mobile emergency units, which requested support from LEAs in 5.10% of OHCAs in 2016 and 13.4% in 2019. In

Table 1
Trend in LEA intervention in emergencies with OHCA

	2016	2017	2018	2019	Total	*P*-trend
Total alerts	9378	9024	9000	9743	37 145	
Alerts for OHCA, n (%)	545 (5.81)	540 (5.98)	540 (6.00)	561 (5.76)	2,186 (5.88)	.861
LEA activation, n (%)	152 (27.9)	256 (28.9)	164 (30.3)	175 (31.2)	647 (29.6)	.003
By CCE	116 (21.5)	98 (18.1)	100 (17.8)	438 (20.0)	0.044	.004
By MEU	40 (7.40)	66 (12.2)	75 (13.4)	209 (9.60)	0.024	.024

CCE, Coordinating Center for Emergencies; LEA, low enforcement agencies; MEU, mobile emergency unit; OHCA, out-of-hospital cardiac arrest.