Suicide Attempts Among LVAD Recipients: Real-Life Data From the ASSIST-ICD Study.

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Our data, analytic methods, and study materials are not available to other researchers.

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Left ventricular assist device (LVAD) implantation is an alternative therapy for end-stage heart failure (HF). However, there are numerous complications with LVADs including psychiatric disorders such as anxiety and depression. Interestingly, data regarding the suicide risk in this population are lacking. Thus, we aimed at describing the incidence of suicide in LVAD recipients included in the multicenter ASSIST-ICD observational study.

ASSIST-ICD is a study of LVAD implanted in 19 French centers (NCT02873169). Detailed methods have been previously published (1). Among the 659 LVAD recipients included, 494 [87% of men; 58.9 (50.3–65.8) years-old] were discharged from the hospital and included in this study. The history of successful/unsuccessful suicide attempts were reviewed. Clinical data, psychiatric history, and characteristics of suicide were collected for each patient. The study was approved by an institutional review committee and that the subjects gave informed consent.

Among the 494 patients, 10 (2.0%) attempted or committed suicide over 18.8 months of follow-up. Eight committed suicide, either by unplugging/sectioning their LVAD cable or drug intoxication, one attempted suicide by drug intoxication, and one attempted suicide by driveline section. Their characteristics are summarized in **Table 1**. Nine were men and 2 had a previous history of psychiatric disorder. Of note, 8 of 10 (80%) patients were implanted as destination therapy (DT) which compares to 162 of 484 (33.5%) patients without suicide, p=0.006. Of the 10 patients who attempted or committed suicide, four did not have a psychiatric evaluation before LVAD surgery. The median duration of hospital stay after LVAD surgery was 46.5 (36.0-70.0) days and suicide attempt occurred on average 12.5 months after the LVAD implantation. Six patients experienced ≤1 hospitalization after initial hospital discharge. A majority of patients (8 of 10) expressed psychiatric symptoms, such as sadness, solitude or hopeless. Lastly, 2 of 10 (20%) patients who attempted or committed

suicide were followed in a center with a LVAD coordinator, compared to 293 of 484 (60.5%) patients without suicide attempt (p=0.02).

In France, the suicide attempt rate is ~0.03% per year (200,000 events/year). However, this frequency increases among patients with chronic diseases such as chronic HF (0.06% per year). In our series, the incidence of suicide in LVAD recipients (2% after 18.8 months of follow-up) appears even higher than those with other chronic diseases. In the INTERMACS registry, psychiatric episodes were estimated around 1% but the prevalence of suicide was not specified (2).

The reasons for the apparently increased incidence of attempted or committed suicide in LVAD recipients are speculative at this point. Our data identified two variables that were associated with attempted or committed suicide: implantation for Destination Therapy and follow-up at a center without a LVAD coordinator. If confirmed by others, the latter is a potentially modifiable practice which could be tested as a means to lower the frequency of suicide. There is plausibility to this finding given that LVAD coordinators are in a unique position, serving as a link between patients' families and medical team, and could potentially identify early symptoms of psychiatric disorders. Similarly, staff at cardiac rehabilitation may have this opportunity though our data did not address this possibility. We did find a high frequency of psychiatric symptoms (80%) among those who attempted or committed suicide, highlighting the role for psychiatrists as part of a multidisciplinary LVAD team.

One could speculate that a number of potential factors, such as alteration of body image, lack of return to full time employment, feeling burdensome to caregivers, or increased dependence on the medical team could contribute to the development of psychiatric symptoms in LVAD recipients. Ensuring that patients have rigorous motivation to the treatment, social support, and extensive pre-operative education about life post-LVAD may mitigate the development of such symptoms. Additionally, assessing patients' satisfaction or

decision regret after LVAD implant potentially could identify those requiring psychological support and detect emerging signs of psychological distress (especially patients implanted as DT) (3).

In conclusion, we found a 2.0% risk of attempted or committed suicide in LVAD recipients, which is higher than the general population or those with other chronic diseases in France. These data emphasize the need to develop strategies to minimize the risk of this devastating event in LVAD recipients, especially amongst those implanted as destination therapy.

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Table 1: Patients characteristics and follow-up. DT=Destination therapy BTT=Bridge to transplant.

	Sex	Age at LVAD surgery/ duration of heart failure (yrs)	Comorbidities	History of psychiatric disease	Social situation	Psychiatric evaluation before LVAD	INTERMACS	LVAD	Days in hospital after LVAD (days)	NYHA after LVAD	6-min WT (m)	Cardiac events / symptoms after LVAD	Hospitalization after LVAD (n)	Psychiatric symptoms expressed	Method of suicide or attempted suicide	LVAD-suicide (months)
#1	M	71 / 17	Dyslipidemia	No	Married 2 children	No	1	DT	84	IV	NA	Asthenia	0	-Sadness -Solitude	Driveline section	3.7
#2	M	71 / <1	Active smoking	No	Widower Alone on an island Girlfriend far away	Yes	2	DT	28	I	NA	Severe RV HF	4	-Aggressive -Sadness -Far from home	Battery disconnection	15
#3	M	59 / 9	Arterial vascular disease, active smoking, alcohol	No	Married	Yes	≥4	DT	170	II	415	Numerous LVAD infections	1	No	Driveline section	8.3
#4	F	49 / 10	Arterial vascular disease, weaned smoking, obesity	-Depression -Suicide attempt	Married Marital dispute	Yes	≥4	DT	13	I	450	Asymptomatic	1	-Malaise -Marital dispute	Battery disconnection	25.9
#5	M	58 / 18	Arterial vascular disease, ischemic stroke, renal insufficiency	No	Married children and grandson	No	2	DT	70	I	NA	Asymptomatic	0	-Hopeless -Ruined his life	Driveline section	24.5
#6	M	70 / <1	Active smoking	No	Married	No	1	DT	48	III	350	Bleeding, pulmonary complication	0	-Failure to thrive	Drug intoxication	1.2
#7	M	50 / 2	Active smoking	No	Dutch living in France for 14 years, divorced, 2 children, financial difficulties, didn't speak French	Yes	≥4	BTT	36	II	435	Asthenia	1	-Sadness -Solitude	Two drug intoxications *(suicide attempt)*	10 and 12
#8	M	64 / 8	Obesity, COPD	No	Married 3 children	Yes	≥4	DT	45	III	400	aortic insufficiency, bleeding	8	-Strong care opposition -Refused psychiatric care	Driveline section	58
#9	M	56 / 1	Obesity	Stable schizophrenia	In relationship	Yes	≥4	BTT	61	III	300	Several LVAD infections	4	No	Driveline section *(suicide attempt)*	48
#10	M	71 / 1	COPD, Stroke	No	Married Marital dispute	No	2	DT	41	III	410	severe COPD	2	-Sadness -No support of his wife -Belittled by his wife	Battery disconnection	10