Rigshospitalet
Hjertecentret

Patient-reported outcomes at discharge predict readmissions in patients with ICD

Selina Kikkenborg Berg[1,6], Trine Bernholdt Rasmussen[2], Rikke Elmose Mols[3], Charlotte Brun Thorup[4], Britt Borregaard[5], Anne Vinggaard Christensen[1], Pernille Fevejle Cromhout[1], Ola Ekholm[6], Knud Juel[6], Lars Thrysøe[5]

1. The Heart Centre, Rigshospitalet, Copenhagen University Hospital, Denmark, 2. Herlev and Gentofte Hospital, Denmark, 3. Aarhus University Hospital, Denmark, 4. Aalborg University Hospital, Denmark, 5. Odense University Hospital, Denmark, 6. National Institute of Public Health, University of Southern Denmark, Denmark

BACKGROUND

More and more emphasis is being put on patient-reported outcomes as credible and important measures of healthcare. Measures such as anxiety, depression and quality of life are linked to adverse outcomes in cardiac patients. More specifically, anxiety and quality of life has been found to predict mortality in patients with an implantable cardioverter defibrillator (ICD). In this study, we aim to investigate patient-reported outcomes as predictors of readmission among patients with ICD.

PURPOSE

To investigate whether perceived health, anxiety, depression, quality of life and symptom burden are predictors of all, acute and elective cardiac readmissions within 3 months of hospital discharge in patients with ICD.

METHODS

A national cross-sectional survey including patients during one year from 5 sites in Denmark (n=998) combined with register follow-up. PROs included: Short Form-12 (SF-12, Physical Component Summary (PCS) and Mental Component Summary (MCS)), the Hospital Anxiety and Depression Scale (HADS), HeartQoL and the Edmonton Symptom Assessment Scale administered at hospital discharge. Questionnaire data were linked to national registers to obtain information on all, acute and elective cardiac readmissions within the first 3 months since hospital discharge. Cox proportional hazard analyses were performed with age as underlying time scale and adjusted for sex, marital status and Tu co-morbidity index. Results are reported as hazard ratios (HR) with 95% confidence intervals (95% CI).

RESULTS

A total of 998 patients with ICD answered the survey (response rate 58 %). Of those 80 % were male, mean age was 64 and 65 % were married. Within 3 months of hospital discharge 313 patients (31 %) were readmitted. Perceived physical health predicted readmission as 1 point increase on PCS resulted in a 2 % reduced risk of acute cardiac readmission. An increase on MCS also reduced the risk of all readmission as well as acute and elective cardiac readmissions. Having a HADS-A or HADS-D score≥8 increased the risk of readmission with approximately 50 %. A 1 point increase on HeartQoL was associated with a reduced risk of all readmissions of 28 %, 31% for acute cardiac readmissions and 41 % for elective cardiac readmissions. Furthermore, higher symptom burden scores on ESAS resulted in increased risk of all readmissions and acute and elective cardiac readmissions, Table 1.

STRENGTHS AND WEAKNESSESS

Patients who were too ill or did not speak or understand Danish were excluded. Responders and non-responders have similar socio-demographic and clinical characteristics. Patients were included in the study at hospital discharge. Even though all had an ICD, patients were at different stages of disease and treatment. The majority of the outcome measures included in the questionnaire were validated and standardized instruments used to assess PROs, which enhances the validity of results. However, some of the instruments have long recall, up to four weeks. Data was received from The National Patient Register which is internationally recognized to be the most comprehensive of its kind and is a very important register for biomedical and public health research.

CONCLUSION

Patient-reported perceived health, anxiety, depression, quality of life and symptom burden are predictors of all, acute or elective cardiac readmissions in patients with ICD. This confirms that several patient-reported outcomes are important measures of health with substantial predictive value.

INTERPRETATION AND IMPLICATIONS

To our knowledge this is the first study to investigate the predictive value of PROs at discharge on readmission in patients with ICD.
Although there are diagnostic tests that can help quantify physical status, most aspects of patient health status are best captured by patients' self-reporting. In addition, there may be significant discrepancies between provider-assessed and patient-reported health status and screening tools might be used to better guide out-patient care and follow up. The biomedical approach to risk factor evaluation where only physical factors such as LVEF and diagnoses are evaluated as risk factors for readmission and mortality is not adequate and misses the full picture. Patient involvement in disease management is critical and mental factors should not be overlooked. Anxiety and depression must be treated and taken seriously in this patient population as evidence of an association with mortality and readmission is building.

Table 1. Predictors of readmissions within 0-3 months after discharge

	Acute cardiac readmissions	Elective cardiac readmissions	All readmissions
	HR (CI)	HR (CI)	HR (CI)
SF-12 PCS (1)	0.99 (0.97-1.00)	0.98 (0.96-1.00)*	0.98 (0.96-1.01)
SF-12 MCS (1)	0.98 (0.97-1.00)*	0.97 (0.96-0.99)*	0.98 (0.96-1.00)*
HADS-A≥8	1.50 (1.13-1.98)*	1.29 (0.90-1.84)	1.45 (0.92-2.27)
HADS-D≥8	1.47 (1.07-2.03)*	1.37 (0.92-2.04)	1.79 (1.09-2.95)*
HeartQoL global (1)	0.72 (0.60-0.86)**	0.69 (0.55-0.87)*	0.59 (0.44-0.79)**
ESAS (1)	1.01 (1.01-1.02)*	1.02 (1.01-1.03)*	1.01 (1.00-1.03)*

PCS=physical component summary; MCS=mental component summary;
HADS-A=Hospital Anxiety and Depression Scale-Anxiety;
HADS-D=Hospital Anxiety and Depression Scale-Depression
* p<0.05; ** p<0.001
(1) The effect of increase by 1 point on the SF-12, HeartQoL and ESAS.

Further information:
selina@rh.dk / www.DenHeart.dk
Conflicts of interest: none.