Global longitudinal myocardial strain: an independent predictor of cardiovascular events in patients with hematopoietic stem cell transplantation

Authors:
A Martin Garcia¹, V Vallejo Garcia¹, L Lopez Corral², AC Martin-Garcia¹, JC Castro Garay¹, A Cabanillas Cabral¹, E Diaz-Pelaez¹, Y Castillo¹, M Barreiro Perez¹, L Rodriguez Estevez¹, C Sanchez Pablo¹, E Cambronero Cortinas¹, PI Dorado Diaz¹, D Caballero Barrigon², PL Sanchez¹, ¹Hospital Universitario de Salamanca-IBSAL-CIBERCV, Cardiology Department. - Salamanca - Spain, ²Hospital Clinico Universitario de Salamanca - IBSAL-CIBERCV, Hematology Department, IBSAL - Salamanca - Spain,

Topic(s):
Tissue Doppler, Speckle Tracking and Strain Imaging

Citation:
BACKGROUND
Hematopoietic stem cell transplantation (HSCT) increases the likelihood of potentially serious cardiovascular complications. The scientific evidence on prognostic predictors is limited and cardiac monitoring of these patients is not systematized.

Our aim was to analyze cardiovascular prognosis and identify echocardiographic factors predicting cardiovascular events in the context of HSCT.

METHODS
An observational, retrospective study was designed, including 243 patients (mean age 54±16yo, 60% males, 13% hypertension, 5% diabetes) undergoing a HSCT (60% Allogeneic/40% Autologous) with previous echocardiography, from December 2016 to the present. Clinical data, echocardiographic findings, mortality and cardiovascular events (CVE) were collected and analyzed.

RESULTS
After a median follow-up of 18 [12] months, 22 patients (9%) suffered CVE (54% arrhythmias, 40% heart failure, and 9% ischemic heart disease). Patients with Allogeneic-HSCT (13% vs. 3%; p: 0.007), left ventricular dilatation (40% vs. 8.5%, p=0.02) or hypertrophy (33% vs. 8%, p: 0.01), dilated left atrium (33% vs. 9%, p:0.03), or pericardial effusion (33% vs. 9%, p: 0.04) in the echocardiographic study performed prior to HSCT suffered significantly more CVE at follow-up. Patients with CVE had significantly higher global longitudinal strain (GLS) (-19±3% vs. -21±3%, p= 0.001). Patients were divided into quartiles based on GLS, those belonging to the fourth quartile (>19.4%) suffered more frequently CVE (log Rank: 9.6; 18% vs. 6%, p=0.002) with a significantly lower time to event (27±1.8 vs. 32±0.6 months) (Figure).

In multivariate analysis (Cox regression), Allogeneic-HSCT (HR: 5.6; p=0.02) and the fourth quartile of GLS (HR: 4.3; p=0.004) were maintained as independent predictors of cardiovascular event.

CONCLUSION
GLS before HSCT is an independent predictor of cardiovascular events at follow-up. This parameter could allow the identification of high-risk patients who could benefit from intensive protocolized cardiac follow-up.
Abstract:

Global longitudinal myocardial strain: an independent predictor of cardiovascular events in patients with hematopoietic stem cell transplantation.


Hospital Universitario de Salamanca-IBSAL-CIBERCV, Cardiology Department. - Salamanca - Spain, Hospital Clinico Universitario, Hematology Department, IBSAL - Salamanca - Spain.

Topic(s): Tissue Doppler, Speckle Tracking and Strain Imaging.

Citation: BACKGROUND

Hematopoietic stem cell transplantation (HSCT) increases the likelihood of potentially serious cardiovascular complications. The scientific evidence on prognostic predictors is limited and cardiac monitoring of these patients is not systematized.

Our aim was to analyze cardiovascular prognosis and identify echocardiographic factors predicting cardiovascular events in the context of HSCT.

METHODS

An observational, retrospective study was designed, including 243 patients (mean age 54±16yo, 60% males, 13% hypertension, 5% diabetes) undergoing a HSCT (60% Allogeneic/40% Autologous) with previous echocardiography, from December 2016 to the present. Clinical data, echocardiographic findings, mortality and cardiovascular events (CVE) were collected and analyzed.

RESULTS

After a median follow-up of 18 ± 12 months, 22 patients (9%) suffered CVE (54% arrhythmias, 40% heart failure, and 9% ischemic heart disease). Patients with Allogeneic-HSCT (13% vs. 3%; p: 0.007), left ventricular dilatation (40% vs. 8.5%, p=0.02) or hypertrophy (33% vs. 8%, p: 0.01), dilated left atrium (33% vs. 9%, p:0.03), or pericardial effusion (33% vs. 9%, p: 0.04) in the echocardiographic study performed prior to HSCT suffered significantly more CVE at follow-up. Patients with CVE had significantly higher global longitudinal strain (GLS) (−19±3% vs. −21±3%, p=0.001). Patients were divided into quartiles based on GLS, those belonging to the fourth quartile (>−19.4%) suffered more frequently CVE (Log Rank: 9.6; 18% vs. 6%, p=0.002) with a significantly lower time to event (27±1.8 vs. 32±0.6 months) (Figure).

In multivariate analysis (Cox regression), Allogeneic-HSCT (HR: 5.6; p=0.02) and the fourth quartile of GLS (HR: 4.3; p=0.004) were maintained as independent predictors of cardiovascular event.

CONCLUSION

GLS before HSCT is an independent predictor of cardiovascular events at follow-up. This parameter could allow the identification of high-risk patients who could benefit from intensive protocolized cardiac follow-up.