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Effect of SGLT2 inhibitor on cardiac function in diabetic patients with or without heart failure: an echocardiographic study

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Background: Recent trials showed that the use of sodium-glucose cotransporter 2 inhibitor (SGLT2i) reduces the occurrence of heart failure (HF). However, the effect of SGLT2i on cardiac function is not fully understood.

Purpose: We aimed to assess the changes in cardiac function assessed by echocardiography in diabetic patients with or without HF.

Methods: Diabetic patients who underwent repetitive echocardiographic examinations from 2014 to 2018 were retrospectively enrolled (n=1107). Among these patients, we identified 202 patients underwent echocardiography before and 1- or 2-year after the initiation of SGLT2i, and compared with 227 diabetic patients without SGLT2i who underwent repetitive echocardiography with same interval. Using propensity score matching, we categorized the study population into 4 groups: patients without HF nor SGLT2i (group 1; n=76), patients without HF and received SGLT2i (group 2; n=78), patients with HF but without SGLT2i (group 3; n=72), and patients with HF and received SGLT2i (group 4; n=74). The changes in echocardiographic parameters were compared between these 4 groups.

Results: After 1- or 2-year of SGLT2i treatment, the left ventricular end-diastolic dimension (LV-EDD) decreased and LV ejection fraction (LV-EF) increased in patients without HF (p=0.036 for LV-EDD, p<0.001 for LV-EF) as well as in those with HF (p<0.001 for both LV-EDD and LV-EF). A modest reduction in LV mass index (LV-MI) was also noted in patients with HF treated with SGLT2i (p=0.05). There were significant differences in changing patterns of LV-EDD, LV-EF, and LV-MI according to the use of SGLT2i in both patients without HF and with HF.

Conclusions: The use of SGLT2i reduced LV-EDD and improved LV-EF in diabetic patients regardless of the presence of HF. These hemodynamic effect of SGLT2i would contribute to the reduction in HF morbidity and mortality in diabetic patients.