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ARTIFICIAL INTELLIGENCE ECHOCARDIOGRAPHY BY NON-CARDIOLOGISTS FOR EARLY DETECTION OF HEART FAILURE IN TYPE 2 DIABETES

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INTRODUCTION

Type 2 Diabetes (T2D) is a well-known risk factor for the development of heart failure. We aim to demonstrate the use of artificial intelligence (AI) echocardiography in the hands of non-cardiology-trained doctors as a useful tool for diagnosing Stage B heart failure in patients with diabetes.

METHODOLOGY

Participants with existing T2D but no known heart failure diagnosis or symptoms of heart failure were recruited. All participants had AI echocardiography (Kosmos portable ultrasound, with image analysis by Us2.AI software) done by non-cardiology-trained doctors, and were tested for NTproBNP. Cut-offs for diagnosis of heart stress or heart failure (HF) were based on 2023 ESC consensus.

RESULT

Among 36 patients (median HbA1c 7.4%; mean BMI 27.3 ± 6.0 kg/m2), 52.8% were on SGLT2i and RASi respectively, 36.1% were on beta blockers and 5.6% were on steroidal MRAs. Seven participants (19.4%) were assessed to have heart failure by AI echocardiography (3 HFpEF, 3 HFmrEF and 1 HFrEF). Out of the 7 cases, only 3 of them had raised NTproBNP. The most common echocardiography abnormality was increased relative wall thickness (RWT, 84%), followed by LV diastolic dysfunction (40.9%), LV concentric remodelling (30.4%) and a high E/e' ratio (12.5%).

CONCLUSION

We have demonstrated that AI echocardiography in conjunction with the biomarker NTproBNP can detect Stage B heart failure among patients with T2D. As most patients are not screened for heart failure until symptoms develop, increasing the availability of this technology may facilitate earlier diagnosis of heart failure and initiation of guideline-directed medical therapy.