- My name is Dr. Ilan Goldenberg. I'm the director of the Clinical Cardiovascular Research Centre at the University of Rochester, and today I'm going to talk about a recent study, that is going to be presented at the American Heart Association conference. The title is "The Effect of Sodium-Glucose Cotransporter 2 Inhibitors and Atrial Arrhythmia Burden in Patients with Cardiac Implantable Electronic Devices".

Background

So, SGLT2 inhibitors have been shown to be associated with significant reduction in the risk of heart failure events in patients who have heart failure, and also in patients who have diabetes. And this may be due to multiple mechanisms, including lowering of intra-hemodynamic and intracardiac filling pressures, increases and reduction in after load and multiple other mechanism, possibly, also reduction in fibrosis in the atrium. And based on those mechanisms, we hypothesize that the favorable hemodynamic effects of SGLT2 inhibitors may translate into a reduction in the risk of atrial arrhythmia and possibly also ventricular arrhythmia in heart failure patients who have cardiac implantable electronic devices.

Study Design and Patient Population

Our study population comprised almost 14000 consecutive patients who were implanted with a cardiac implantable electronic devices, who were enrolled with Tosha medical centres in the US, and in Israel. Those CIDs included pacemakers, ICDs, CRTDs and ICMs and all the arrhythmic events captured by the electronic devices were independently adjudicated by EP specialist in the two institutions. The primary endpoint of the study was the total number of actual arrhythmic events detected by the CIDs, the cardiac implantable electronic devices, and secondary endpoints included the total number of ventricular arrhythmias, the composite endpoint of atrial and ventricular arrhythmias in all-cause mortality. In order to account for imbalances between patients who are treated and not treated with SGLT2 inhibitors, we use propensity score modelling and in a secondary analysis, also propensity score matching.

Key Findings

So we had a total follow up of almost 25000 patients here, which is a long time. And during this time period, there were almost 20000 atrial arrhythmic events and more than 3000 ventricular arrhythmic events. And propensity score analysis, interestingly, identified the treatment of the SGLT2 inhibitors was associated with a significant 24% reduction in the risk of total atrial arrhythmic events and what is significant, also 24% reduction in the risk of the composite endpoint of atrial and ventricular arrhythmic events and with a pronounced 42% reduction in the risk of all-clause mortality while treatment of the drug was not associated with a significant reduction in the risk of ventricular arrhythmic events. Importantly, we also use confirmatory analysis, using propensity score matching and again, we saw that treatment with SGLT2 inhibitors was associated with a significant 23% reduction in the risk of atrial arrhythmias, 22% reduction in the risk of the composite endpoint of atrial and ventricular arrhythmias. And again, with a pronounced 24% reduction in the risk of all-cause mortality.

Take-home messages

We believe that our findings suggest that the use of SGLT2 inhibitors is associated with a pronounced reduction in the risk of atrial arrhythmia burden and all-cause mortality in patients who are implanted with cardiac implantable electronic devices in a real world setting. And this data indicates that those drugs, beyond the heart failure improvement, they have possible anti-arrhythmic properties that are incremental to the beneficial effect of the drug on the heart failure outcomes.

Next Steps

I believe that some perspective randomised clinical trials are needed to evaluate the effect of the drug on atrial arrhythmia, possibly in patients who undergo atrial fibrillation ablation and those who have new onset atrial fibrillation. Randomization of the patient for the drug versus placebo to further validate the possible use of SGLT2 inhibitors as anti-arrhythmic medications.