Radiation Exposure of Patients Undergoing Transcatheter Aortic Valve Implantation: a Comparison between Edwards SAPIEN XT and Medtronic CoreValve Aortic Valve Prostheses

Maayan Konigstein[1], Arie Steinvil[1], Galit Aviram[2], Yigal Abramowitz[1], Shmuel Banai[1], Amir Halkin[1], Yaron Arbel[1], Yanai Ben-Gal[1], Gad Keren[1], Ariel Finkelstein[1]
[1]*Cardiology, Tel Aviv Medical Center, Israel*
[2]*Radiology, The Tel Aviv Medical Center, Israel*

Background:
Transcatheter aortic valve implantation (TAVI) is an emerging procedure for the treatment of high risk patients with severe aortic stenosis.Little is known about radiation exposure of patients undergoing TAVI. Our aim was to quantify radiation exposure during TAVI, comparing two different prosthesis types.

Methods:
We analyzed 300 consecutive patients undergoing TAVI from March 2009 to September 2012, at our interventional cardiology unit. Patients undergoing procedures requiring additional use of radiation than needed for the TAVI procedure itself, for either diagnosis or further intervention, were excluded. Air Kerma (Kinetic Energy Released per unit MAss), cumulated dose area product (DAP) and fluoroscopy time were determined for each patient.

Results:
In our final analysis 248 patients undergoing uncomplicated transfemoral TAVI were included. The Edwards SAPIEN XT and the CoreValve prostheses were implanted in 44 and 204 patients, respectively. Although mean radiation exposure was similar to previous reports, we found a significantly higher exposure to radiation measured by air Kerma and DAP in patients implanted with a CorValve prosthesis (both p0.05). Using a multi variant regression models, the prosthesis type was a significant predictor for both air kerma and DAP (r^2=0. 498; p0.01 and r^2=0.363; p0.01, respectively). Other variables found to correlate with either air Kerma or DAP were gender, aortic valve area, BMI (body mass index), CAF (Chronic Atrial Fibrillation), CHF (congestive heart failure), prosthesis size and fluoroscopy time.

Conclusion:
In uncomplicated transfemoral TAVI, patient radiation exposure is higher with CoreValve implantation than with Edwards SAPIEN XT implantation