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Fusion aortic valve area: is it a reliable imaging method in symptomatic patients with severe aortic stenosis?

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THEME: Interventions for Valvular Disease

TOPIC(S): TAVI

AIMS

Aortic valve area (AVA fusion) as assessed using CT estimated left ventricle outflow tract (LVOT) area is used in order to evaluate the severity of aortic stenosis in borderline patients with mild symptomatology. This is due to the inability of 2D echocardiography to accurately evaluate the oval shape and the calcified borders of LVOT area. Whether this has also any significant impact on severe symptomatic aortic stenosis or not is not clear.

METHODS AND RESULTS

Seventy-three consecutive patients (81 ± 6 years, 44 males (60.3%)) with symptomatic aortic stenosis were evaluated for the severity of aortic stenosis with ultrasound echocardiography and MSCT. Ultrasound echocardiography was used in order to assess LVOT in long-axis 2D view and VTI in aortic valve and in LVOT using color-Doppler. MSCT was used in order to evaluate LVOT area. Using the equation of continuity AVA as well as AVA fusion were evaluated as follows: Echo AVAi: $(\text{LVOT}/2)^2 \times \text{Echo VTI PW LVOT} / \text{Echo VTI CW Aortic valve}$ and Fusion AVAi: $(\text{LVOTAREA} \times \text{Echo VTI PW LVOT}) / \text{Echo VTI CW Aortic valve}$. MSCT was also used in order to measure total calcium score (TCS). Patients were separated into two groups according to TCS values. (Group I: $\text{TCS} < 1600$ for women and < 3000 for men, Group II: $\text{TCS} \geq 1600$ for women and ≥ 3000 for men). Mean values of Fusion AVAi ($0.65 \pm 0.27 \text{ cm}^2/\text{m}^2$ vs $0.35 \pm 0.08 \text{ cm}^2/\text{m}^2$, $p=0.001$) differed significantly when compared with mean values of Echo AVAi. Finally, CTA LVOTarea and US LVOTarea differed significantly both in Group I ($5.52 \pm 1.32 \text{ cm}^2$ vs $3.13 \pm 0.77 \text{ cm}^2$, $p<0.001$) and in Group II ($5.41 \pm 1.64 \text{ cm}^2$ vs $2.88 \pm 0.63 \text{ cm}^2$, $p<0.001$).

CONCLUSIONS

In conclusion, MSCT needs to be performed for the proper evaluation of LVOT area and consequently of AVAi in symptomatic aortic stenosis patients.