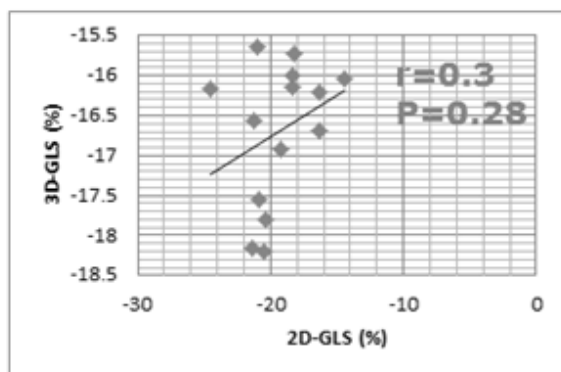


### Interference of BMI with accuracy and validity of 3D-STE data

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**Introduction and Objectives:** 3D echocardiography is recently the gold standard for volumetric assessment of LV as well as EF (EAE guidelines), deformation imaging alternatively called speckle tracking is undergoing constant development; one of those most revolutionary advances is the development of 3D derived STE. Compared to 2D STE, 3D STE not only allows assessment of the 3 components of strain simultaneously but also markedly shortens the duration of processing. However many known limitations exist to 3D STE, one of them is the occurrence of stitch artifact in the absence of breath holding which makes it difficult to use in infants. To our knowledge no or few studies have shown the effect of increasing BMI on the accuracy and validity of 3D echocardiographic data. The aim of this study is to show the pattern of variation of a single parameter: Global longitudinal strain (GLS) using 2D and 3D approach. **Methods:** Twenty seven normal persons were recruited from outpatient clinics in Padova/Cairo universities. 2D and 3D-STE were initially performed to all candidates to study the pattern of variation of GLS with varying BMI. Candidates were divided into two groups Group I with BMI (Body mass index) between 15-19 and Group II with BMI 20-25, in each group 2D and 3D GLS was determined and the coefficient of variation between both was determined. **Results:** There was no statistically significant difference between 2D derived GLS (-16.47%±0.93) and 3D derived GLS (-16.45% ± 0.81) in Group I while in Group II 2D derived GLS (-19.36%±2.59) was significantly higher from 3D derived GLS (-16.69%±0.88) with a P-value of 0.002. The coefficient of variation between 2D derived and 3D derived GLS in Group II was 11.2%±7.2 compared to 1.12 %±0.84 in Group I with a P-value <0.005. **Conclusion:** We conclude that statistically significant differences exist between 2D and 3D derived GLS in higher BMI with tendency of 3D STE to underestimate GLS with higher body weights. This may reflect the interference of fat with acoustic windows and full volume acquisition in 3D echocardiography.



**Footnote of the Figure:** Correlation graph between 2D and 3D GLS in the group II with BMI between 20-25.