Tissue Doppler, Speckle Tracking and Strain Imaging

Segmental and global longitudinal strain differences between children with paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 pandemic and Kawasaki disease

Piccinelli E.[1]; Herberg J.[2]; Kang H.[1]; Fraisse A.[1]; Krupickova S.[1]; Altamar IB.[1]; Sabatino J.[3]; Singh Y.[4]; Bautista-Rodriguez C.[1]; Di Salvo G.[5]

[1]Royal Brompton and Harefield Hospital, London, United Kingdom of Great Britain & Northern Ireland
[2]St Mary"s Hospital, London, United Kingdom of Great Britain & Northern Ireland
[3]Magna Graecia University of Catanzaro, Catanzaro, Italy
[4]Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom of Great Britain & Northern Ireland
[5]University of Padua, Padova, Italy

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Introduction: The paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 (PIMS-TS) and Kawasaki disease (KD) have overlapping features. This study aimed to describe the strain segmental analysis among both entities.

Methods: Retrospective review of strain segmental analysis within 4 weeks of presentation of symptoms among children diagnosed with PIMS-TS between April and June 2020 and a historic cohort of typical KD from the Royal Brompton Hospital, London.

Results: We included 33 PIMS-TS patients (23 males, 69.7%) at a mean age of 8 ± 4,9 years old and 45 KD patients (31 males, 68,9%) at a mean age of 5,8 ± 4,5 years old. PIMS-TS patients were older at presentation (p = 0.038). Left ventricle ejection fraction (LVEF) was normal in both groups (63,3% vs 63,5%; p= 0,89), 4/33 PIMS-TS children (12,1%) had coronary arteries abnormalities (CAA), whereas 100% of KD cohort had CAA. Both groups had a normal global longitudinal strain (GLS),but in PIMS-TS it was significantly reduced compared to the KD group (-20% vs -22%; p = 0,008). Basal segments were the most affected in PIMS-TS with significant difference in the basal anterior and anterolateral strain compared to KD (respectively -18,2% vs -23,4%; p < 0,001 and - 16,7% vs -22,7%; p < 0,001). PIMS-TS had a greater anterior, anterolateral and posterior segments involvement with a significant reduction in the anterolateral mid-wall longitudinal strain (-18,3% vs -22%; p = 0,002). Apical segments were less involved, with significant difference only in the septal and inferior apical strain (respectively p = 0.001 and p = 0,032).

Conclusions: These preliminary data showed that after 4 weeks from the onset of symptoms, all PIMS-TS patients had a normal LVEF but they had a significant reduction in GLS and different segmental involvement compared to KD cohort. We hypothesize that these findings may be related to direct myocardial damage in PIMS-TS rather than caused by coronaries perfusion abnormalities.

Abstract Figure. Bull"s eye