Background: In advanced ankylosing spondylitis (AS), bone ankylosis or ossification of the involved joints can make the chest practically immobile, decrease its compliance, or even lead to intercostal muscle atrophy.

Objectives: The purpose of the study was to evaluate chest involvement in AS by measuring toracoabdominal movements during quiet breathing, by dividing the chest and abdominal contribution to the current volume, by inductive plethysmography methods.

Methods: 60 consecutive patients were recruited from the Rheumatology Department of the Republican Clinical Hospital. They were selected based on AS diagnosis, with no existing cardiovascular or neuromuscular diseases that would alter respiratory mechanisms and the absence of severe obesity.

Results: Monotherapy with DMARD was 27 out of 60 patients (45%; Sulfasalazine 3 g/day) for a period of 1–48 months (mean value=19.4 (15.5) months). There were no differences in the angle of the Ct-Abd curve between patients with DMARD and DMARD-naive treatment (39.2 (14.5)° and 34.7 (19.5)° for sitting position, 49.3 (18.1)° and 47.2 (23.1)° in orthostatism, and 19.1 (15.6)° and 16.1 (14.6)° for clinostatism, p<0.05). In the baseline study, the Ct-Abd patient angle was lower than the control group in sitting position (36.3 (17.3)° and 51.5 (8.9)°, p=0.0002) in orthostatism (48.1 (20.8)° and 62.4 (12.5)°, p<0.01) or orthostatism (17.4 (15.0)° and 24.5 (9.8)°, p<0.05). In the entire patient group, the Ct-Abd angle correlated negatively with BASFI in all the three body positions (r=−0.50, p<0.0001 in sitting position, r=−0.36, p<0.01 in orthostatism, r=−0.47, p<0.001 in clinostatism); did not correlate with BASDAI, BASMI, or the modified Schoeber test in either of the three body positions.

In 15 AS patients who underwent repeated measurements of toracoabdominal movements while receiving their associated DMARD treatment (Methotrexate 15 mg/week and Sulfasalazine 3 g/day) for the first 3 months of treatment, the angle of the Ct-Abd slope was significantly higher than that of the fundamental study, in all body positions. The Ct-Abd angle continued to increase, with increments less pronounced and reached significant value only between measurements of 3 months and 12 months. Improvements in standardised clinical signs following associated DMARD treatment followed a similar pattern, with scores at each interval significantly different from those measured in the baseline study, improvements continuing at a faster pace slowly after the third month. In the control group, the angle of the slope of the Ct-Abd curve was not different in the two measurements in any of the body positions (51.4 (8.9)° and 50.7 (9.3)° in the sitting position, 62.4 (12.4)° and 61.6 (11.8)° in orthostatism, and 24.6 (9.8)° and 23.4 (9.8)° in clinostatism, p<0.05). In orthostatism, the difference between the measurements was 0.8° (confidence interval 95% −0.9 to 2.52, upper and lower boundaries of 6.6° and 8.2°).

Conclusions: The slope of the Ct–Abd curve during quiet breathing correlates negatively with BASFI and responds significantly to associated DMARD treatment and NSAIDs. Our data suggest that this measure can be targeted for further evaluation of its usefulness in monitoring chest involvement and its response to treatment in AS patients.

Disclosure of Interest: None declared.